THE JOURNAL
of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. 164, NO. 5 CHICAGO, ILLINOIS JUNE 1, 1957
COPYRIGHT, 1957, BY AMERICAN MEDICAL ASSOCIATION

SURGICAL MANAGEMENT OF THE SEVERELY BURNED CHILD

Robert S. Smith, M.D., Boise, Idaho

• *Two case histories illustrate the surgical principles involved in the care of the severely burned child. A 5-year-old girl with extensive third-degree burns was carried through the initial period of shock by supportive treatment which included the administration of dextrose, electrolytes, serum albumin, and whole blood by venoclysis. Dressings were changed at four-to-six-day intervals under general anesthesia in the operating room. Wound infection was avoided, and sufficient skin for stamp-grafts was obtained from donor areas which, since healing, are covered by ordinary clothing. A 12-year-old girl, seven months after a similar burn, showed severe depletion and anemia, extensive infection, and pressure sores on both hips. Multiple transfusions were necessary to improve the general condition of the patient; antibiotics stopped the fever. Dressings were changed under general anesthesia, and subsequent graftings of skin were successful. An aggressive two-way plan of action is indicated in severe burns: general, systemic measures to combat infection and improve the patient's nutritional state, and specific, surgical measures to bring about the covering of the open wound with skin at the earliest possible moment. The skin coverage obtained by stamp-like grafts is permanent and in the experience of the author has proved to be of generally good functional quality.*

When a child suffers an extensive third-degree burn, the initial shock of the injury is frequently so great as to threaten an immediate fatality. Aggressive and intelligent supportive treatment will give the youthful patient a good chance to survive this first critical period, however. In most of these cases, much greater effort on the part of the attending surgeon will be required subsequently before the skin closure which is essential to recovery is obtained. Final restoration of body function and features may be achieved only by multiple secondary operative procedures and after a long period of careful surgical supervision.

Permanent complete wound coverage by early resection of devitalized tissue and a single application of free sheet-like grafts of skin would provide the ideal solution for most of the problems of the severely burned child. In extensive deep burns, with involvement approaching 50% of the body surface, rapid wound closure is usually not possible. In these severe cases, the large size of the wounds frequently presents such technical difficulties that operative management in stages is advisable.

Biological Dressings

Brown and his associates [1] have presented a good case for the use of skin homografts for early coverage of severe burn wounds. Homografts, in effect, have provided biological dressings and have appeared to give lifesaving support to many patients.

Grafts derived from cadaver sources may be kept available for emergency use in a skin bank and, when properly applied, will "take" on a burn wound, whether or not donor and recipient blood groups are compatible. Apparently as the result of an antigen-antibody reaction, however, almost all these homografts will begin to disintegrate after 2 weeks, and their total disappearance may be expected after 8 to 10 weeks. In two unusual situations homografts appear to persist indefinitely: when a skin graft is transferred from one identical twin to another,[2] and when a skin graft is applied to a recipient with agammaglobulinemia.[3]

After the application of homografts, patients are given vigorous general supportive treatment in preparation for the inevitable replacement of the homografts by autografts. Large sheets of the patient's own skin are preferable for replacement procedures, but Brown and Fryer [4] have suggested that, when donor sites are limited, autografts may be placed in strips between dissolving homografts in such a way that their proliferation eventually provides a permanent epithelial coverage. Using a technique based on similar considerations, Jackson [5] has successfully treated a large number of severely burned patients by the primary application of homografts and autografts in alternating strips.

Read before the 10th Clinical Meeting of the American Medical Association, Seattle, Nov. 29, 1956.

On the basis of experimental findings, Najarian and McCorkle [6] have recently suggested the use of a suspension of skin particles, a so-called skin milk shake, to obtain rapid healing of large third-degree burn wounds. The value of this technique has yet to be determined in actual practice. It is expected, however, that the skin coverage supplied by the method will

Fig. 1 (case 1).—Third-degree burns of back and neck; skin sloughs are beginning to separate two weeks after severe burn.

be most applicable as a biological dressing to prevent sepsis in severely burned patients. It is probable that little or no dermal pad will develop as the wounds heal, and secondary reconstructions with the use of sheet-like autogenous split grafts will probably be necessary in most locations for optimum function.

Segmented Dermatome Grafts

One clinically proved method of supplying definitive skin coverage in extensive burns depends on the primary application of autogenous dermatome grafts in relatively small rectangular segments. These grafts are scattered over the wound, do not require suture, and have been described variously in the literature as "stamp" [7] or "patch" [8] grafts. The principle of the technique is not new, having been introduced by Goode in 1935,[9] but the method has been greatly facilitated by recent refinements in the techniques of cutting and handling thin skin grafts.

Small skin patches have been found to "take" more surely on recently denuded and granulating surfaces than large sheets of skin, and they are relatively insusceptible to the effects of infection and hematoma formation. Stamp-like dermatome grafts are particularly efficacious in supplying skin coverage in severely burned children when the wound resulting from a deep thermal injury is very large and available donor skin is limited. If applied to a burn wound in small free pieces, these grafts may exhibit an appreciable loss of normal skin tension and show a troublesome tendency to curl and roll in. Dermatome grafts which have been cemented to rayon fabric,[10] Pliofilm,[11] or the rubber-fiber backing of the Reese Dermatape,[12] however, show no tendency to contract when cut up into small segments and may be effectively applied to wound bases by ordinary pressure dressings.

Acute Burns

A definite plan of closed-wound management is followed when stamp-like dermatome grafts are to be applied in the treatment of a severe acute burn in a child. Because the full thickness of the skin is involved, and since the majority of patients show circumferential injury, there are few indications for exposure methods.

Using an aseptic technique, the surgeon usually subjects the burned areas to an initial gentle cleansing and applies a pressure dressing. The basic layer of the compression dressing is of fine mesh gauze, which may be coated lightly with a bland ointment or moistened by frequent irrigations with isotonic sodium chloride solution. Dressings of fine mesh gauze impregnated with nitrofurazone (Furacin) have proved especially useful in the management of the burn wound, since the water-soluble base of this bacteriostatic agent insures free drainage of wound exudates but does not cause unfavorable maceration of adjacent tissues.

Unless suspicion of infection suggests the need for earlier examination, the first dressing is not changed for about a week. A general débridement, in which the Brown electric dermatome is used according to the technique of Meeker and Snyder,[13] may then be carried out. Surgical débridement in stages, in connection with later dressings, is somewhat less traumatic and accomplishes the same purpose.

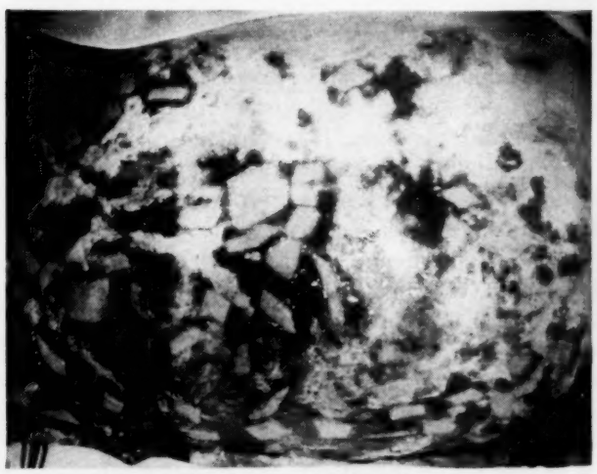


Fig. 2 (case 1).—Wounds of right side of thorax three weeks after third-degree burn. Scattered stamp grafts (Reese dermatome), applied four days earlier at first skin-grafting operation, have taken well; deep skin sloughs are still in process of separation around healthy grafts.

When compression dressings are changed at intervals of several days, the separation of sloughs is favored, and these are gently removed. The use of

enzymes to facilitate débridement would seem unnecessary in most cases. While a few deep sloughs will separate slowly and tend to hang on, most of the wound is rapidly cleared of devitalized tissue and is soon ready to receive split-thickness skin grafts. Skin grafts taken by the Reese dermatome, when left on their rubber backing, are readily cut up into pieces of postage-stamp size, or larger, and distributed over denuded areas. The free grafts are held in place solely by pressure dressings and may be expected to show good "takes" when their rubber backing is removed after four or five days. Since the small grafts present many edges for epithelial proliferation, maximal skin coverage is secured by each operative procedure.

All dressings are changed and grafts applied with the patient under general anesthesia. It is believed that in the child patient the psychological benefits to be derived from the avoidance of pain in dressing changes far outweigh the theoretical disadvantages of multiple anesthetizations.

With the use of these techniques and with initiation of grafting operations as soon as skin sloughs begin to separate, wound coverage in the severely burned child can be accomplished within a reasonably short time. When granulations form, these are kept flat and firm by compression dressings, and stamp grafts may be applied successfully on this heathy base without further preparation. Staging of the operative procedures provides a wide margin of safety. Each operation should require only a brief anesthetization, and there should be little blood loss.

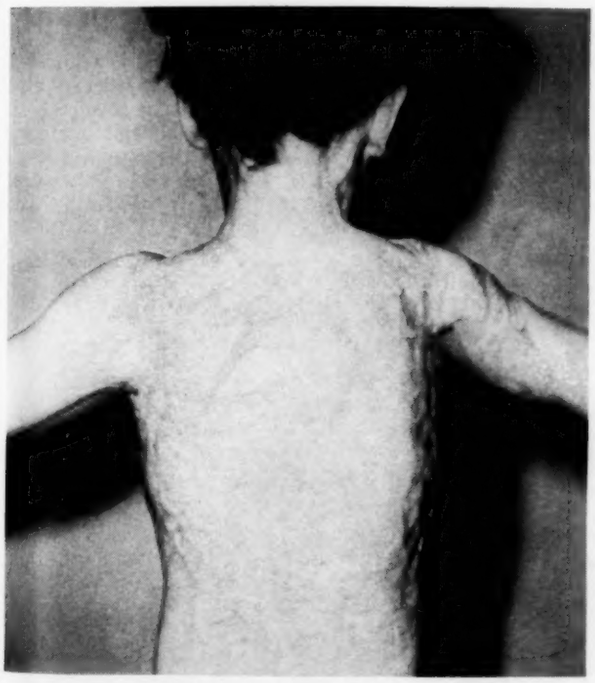


Fig. 3 (case 1).—Eight months after burn, stamp grafts on back and neck show excellent function.

In conjunction with the treatment of the local wound, measures are taken to maintain the patient in a state of good general nutrition. If the nourishment taken voluntarily is insufficient, supplementary tube feedings are employed. Transfusions of whole blood are given to replace elements lost through exudates, and broad-spectrum antibiotics may be administered to prevent sepsis or the development of infection in tissues imediately involved by the burn.

It is true that the skin coverage secured by the use of free stamp-like grafts may be somewhat deficient from the cosmetic standpoint. These grafts have shown

Fig. 4 (case 1).—Eight months after burn, donor sites on abdomen, chest (below left nipple), entire left thigh, and inner surface of right thigh show minimal scarring and may be used again to supply skin for reconstructive purposes. All donor sites are covered by ordinary clothing.

excellent late function, however, when they have been applied to plane surfaces of the body. Since each split-graft segment carries a substantial dermal substratum, the ultimate development of a high degree of functional resiliency in grafted areas may be expected.

When feasible, relatively thick sheet-like dermatome grafts should be applied as early as possible in situations in which crippling scar contractures are prone to develop. Early and complete skin coverage is very desirable in wounds involving the face, neck, axillas, and groins and the popliteal and antecubital regions. If, in spite of all preventive efforts, serious joint contractures occur, these may be corrected by secondary operations. Final satisfactory results may be secured by further insertions of larger dermatome grafts or by the use of Z-plasties, the shifting of skin flaps, or the free transfer of full-thickness skin grafts. The fact that the original dermatome grafts are cut at a depth of 0.01 in. or less allows additional "crops" of skin to be taken as necessary from the available donor areas.

Chronic Burn Wounds

Scattered stamp-like grafts of the patient's own skin may be used to obtain wound closure in the large chronic burns that are occasionally seen in children. These patients, who represent serious therapeutic failures, may present themselves months after their thermal injury in a very debilitated condition.

Fig. 5 (case 2).—Large granulating wounds of back and left thigh are present seven months after severe burn. There is evidence of attempt to obtain healing by pinch grafts. Scars in interscapular region indicate donor site for pinch grafts.

The wounds in such cases are characterized by unhealthy, soft, exuberant granulations and show the profuse purulent discharges which typify established infections. In many cases, spontaneous healing reactions already may have produced scar contractures affecting important joints, and pressure sores are common.

An aggressive two-way plan of management is indicated in these patients. General measures to improve nutrition and combat infection must be pushed vigorously. At the same time, the open wound must be covered with skin at the earliest possible moment.

When donor areas are limited, the use of scattered stamp-like dermatome grafts may represent the best solution of the skin-coverage problem. It is essential to prepare the chronic open wound carefully, however, before skin grafts are applied. The application, with pressure, of dressings of fine mesh gauze impregnated with a bland ointment is usually effective in producing in a short time a wound environment which is favorable to skin grafting. The edematous granulations flatten out, becoming firm and more vascular, and wound discharges diminish.

The application of antiseptics or antibiotic agents locally may hasten the control of infection, but it is believed that the mechanical factors involved in frequent changes of pressure dressings are most important in preparing a wound for skin grafting. While the shaving down of granulations tends to improve the base for skin grafting, the blood loss involved in such operative preparation precludes its routine employment in the large wounds of this chronically ill group of patients.

It is remarkable how rapidly the child patient shows improvement as skin coverage is provided for a chronic open wound which has resulted after an extensive deep burn. Reduction in pain and fever and the control of tissue element depletion lead to improvement in weight, strength, and morale.

After wound closure has been effected by the application of stamp-like dermatome grafts, months may be required for epithelial stabilization and the softening of associated scar tissue. Residual functional defects are usually corrected by standard plastic surgical procedures at a late date, when these children are in good general condition and when only ordinary surgical risks are involved.

Report of Cases

The following case reports illustrate the use of free stamp-like dermatome grafts in the management of acute and chronic wounds resulting from severe burns.

Case 1.—The patient, a female, aged 5 years, suffered an extensive burn when her nightgown caught fire from an open fireplace. A third-degree burn involved the entire back, the buttocks, the right side of the chest, and most of the neck (fig. 1); second-degree and third-degree burns involved more than 50% of the right upper extremity and the right thigh. Careful supportive treatment, including the administration of dextrose, electrolytes, serum albumin, and whole blood through a cannula inserted by cut-down in an ankle vein, carried the patient through the initial period of shock.

Coverage of the large burn wound was subsequently accomplished by the staged application of stamp-like dermatome grafts (fig. 2). Dressings were changed at four-to-six-day intervals in the operating room, with the patient under general anesthesia, and five skin grafts were performed. Antibiotics were administered on a prophylactic basis. Combiotic, a combination of penicillin and dihydrostreptomycin, was used first, and later tetracycline (Tetracyn). Wound infection did not develop. Healing was obtained in eight weeks.

The patient has had secondary insertions of large sheet-like dermatome grafts to control contracture tendencies on the right side of the neck and in the right axilla. At present, after eight months, there is no serious functional difficulty (fig. 3). The right upper extremity and the right side of the neck are involved by hypertrophic scars, however. Further reconstructive operations appear advisable in this case in order to obtain the best possible result as regards function and appearance. Donor sites are abundant, since there is minimal scarring of the original stamp-graft donor areas on the left side of the chest, abdomen, and thighs (fig. 4); no grafts were cut from the left arm and shoulder or from other sites which cannot be covered by ordinary clothing.

Fig. 6 (case 2).—Removal of rubber backing from stamp grafts five days after first grafting operation. Grafts had been cut at 0.008 in. with the Reese dermatome. Good "take" of grafts is evident.

Case 2.—The patient, a female, aged 12 years, was first seen seven months after a severe gasoline burn. At this time, she showed general depletion, and an established infection in extensive chronic burn wounds. Open granulating areas were

present on the left thigh, the lower back and buttocks, the lower part of the chest on the left, and on the abdomen; red hypertrophic scars on the left arm marked the sites of spontaneous healing reactions. Deep-pressure sores had exposed the anterior-superior spine of the ilium on either side. Pinch grafts which had been transplanted from the interscapular region to the lower back had resulted in the epithelization of only a few scattered areas.

On admission to the hospital, the patient showed a marked secondary anemia, with a blood hemoglobin value of 68%. The temperature was of septic type, with a daily elevation to 102 F (38.9 C). Wound discharges, which were initially profuse, were controlled by compression dressings, a basic layer of fine mesh gauze impregnated with nitrofurazone being applied directly on the granulating surfaces. Multiple transfusions were given to correct the hemoglobin deficiency, and the patient's fever receded after the administration of antibiotics. In the treatment of this patient's penicillin-resistant micrococcic (staphylococcic) infection, chloramphenicol (Chloromycetin) was first used; later, chlortetracycline (Aureomycin) proved more effective.

Three dressing changes, with the patient under general anesthesia, at four-day intervals, were required to prepare the wounds for skin grafting (fig. 5). When the preparation of the wounds had been completed, three large dermatome grafts were taken from the right thigh, cut up into rectangular segments averaging 1 by 1.5 in., and distributed generally over the granulating areas of back and buttocks. A good "take" of the free skin transplants occurred (fig. 6). Two weeks later, similar stamp grafting of the wounds of the left side of the chest, abdomen, and left thigh was carried out.

Because it had seemed advisable to space the grafts of the first two operations widely on the wounds, secondary applications of small free grafts were required. Complete skin coverage was accomplished by three additional minor skin-grafting procedures, in which the right thigh and the right side of the abdomen were used as donor areas, and the patient was discharged from the hospital after 10 weeks. A year later full-thickness skin flaps were shifted to improve the coverage of the anterior-superior iliac spines, the sites of the previous pressure sores, and keloids developing on the left arm were replaced by thick dermatome grafts.

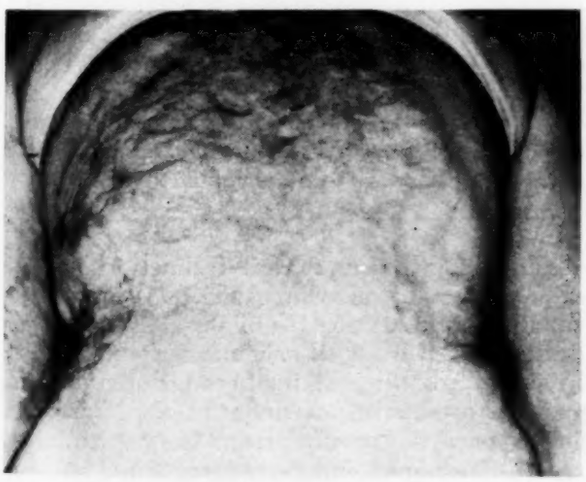


Fig. 7 (case 2).—Four years after application of stamp grafts to back. Excellent function is shown; no limitation of forward bending.

After four years, this patient shows excellent function of the trunk and lower extremities (fig. 7 and 8). The stamp grafts are soft and pliable, and scars between the grafts show no tendency to hypertrophy. There is minimal scarring of donor sites, although successive "crops" of split-thickness grafts were taken during the course of treatment.

Summary

Ideally, a large third-degree burn in a child is managed surgically by complete coverage of the wound by skin grafting as soon as devitalized tissue can be removed and a healthy base established. If the skin grafts can be applied in relatively thick sheets, satisfactory function may be anticipated in most locations without further treatment.

Management that represents a compromise with the ideal may be necessitated by the large size of the burn and a corresponding limitation of skin donor areas. Brown's use of homografts from cadavers is undoubtedly of great potential value for the emergency handling of mass burn casualties. The method has the disadvantage of providing a wound coverage which is temporary in nature. The skin "milk-shake" techniques of Najarian and McCorkle, which have proved effective on an experimental basis, also will probably leave something to be desired in the treatment of individual patients.

The use of free stamp-like dermatome grafts is recommended as a surgical expedient to accomplish primary wound closure in very large burns in children. The skin coverage obtained by stamp-like grafts is permanent and should prove to be of generally good functional quality. If late secondary contractures occur, these may be relieved by elective plastic operations of more conventional type.

Fig. 8 (case 2).—Four years after skin grafting, patient shows excellent development and nutrition. Grafts on left thigh function well. Donor sites on right thigh and trunk were used several times; they show minimal scarring, however, and are concealed by ordinary clothing.

312 W. Idaho St.

References

1. Brown, J. B.; Fryer, M. P.; Randall, P.; and Lu, M.: Postmortem Homografts as "Biological Dressings" for Extensive Burns and Denuded Areas: Immediate and Preserved Homographs as Life-saving Procedures, Ann. Surg. **138:**618-630 (Oct.) 1953. Brown, J. B.; Fryer, M. P.; and Zaydon, T. J.: Skin Bank for Postmortem Homografts, Surg. Gynec. & Obst. **101:**401-412 (Oct.) 1955.

2. Brown, J. B.: Homografting of Skin: With Report of Success in Identical Twins, Surgery **1:**558-563 (April) 1937. Cox, P. A., and Fredricks, S.: Successful Homografting Between Identical Twins, Plast. & Reconstruct. Surg. **18:**141-145 (Aug.) 1956.

3. Good, R. A., and Varco, R. L.: Successful Homograft of Skin in Child with Agammaglobulinemia, J. A. M. A. **157:**713-716 (Feb. 26) 1955.

4. Brown, J. B., and Fryer, M. P.: Postmortem Homografts to Reduce Mortality in Extensive Burns: Early "Biological" Closure and Saving of Patients for Permanent Healing; Use in Mass Casualties and in National Disaster, J. A. M. A. **156:** 1163-1166 (Nov. 20) 1954.

5. Jackson, D.: Clinical Study of Use of Skin Homografts for Burns, Brit. J. Plast. Surg. **7:**26-43 (April) 1954.

6. Najarian, J. S., and McCorkle, H. J.: Unpublished experimental findings presented at Forum on Fundamental Surgical Problems, 42nd Annual Clinical Congress of the American College of Surgeons, San Francisco, Oct. 9, 1956.

7. Hardy, S. B., and McNichol, J. W.: Dermatome Pliofilm Stamp Grafts, Am. J. Surg. **92:**107-114 (July) 1956.

8. Lewis, G. K.: Use of Patch Graft in Extensive Skin Loss, Plast. & Reconstruct. Surg. **12:**116-122 (Aug.) 1953.

9. Goode, J. V.: Skin Grafting, Ann. Surg. **101:**927-932 (March) 1935

10. Blocker, T. G., Jr.: Present Status of Treatment of Severe Burns, Texas Rep. Biol. & Med. **7:**484-491, 1949.

11. Webster, J. P: Film-Cemented Skin Grafts, S. Clin. North America **24:**251-280 (April) 1944.

12. Reese, J. D.: Dermatape: New Method for Management of Split Skin Grafts, Plast. & Reconstruct. Surg. **1:**98-105 (July) 1946.

13. Meeker, I. A., Jr., and Snyder, W. H., Jr.: Dermatome Débridement and Early Grafting of Extensive Third Degree Burns in Children, Surg. Gynec. & Obst. **103:**527-534 (Nov.) 1956.

TREATMENT OF MILD DEPRESSIONS IN GENERAL OFFICE PRACTICE

Frederick Lemere, M.D., Seattle

• Depression manifests itself in both mental and physical symptoms, some of which escape recognition unless the physician is alert. The mental symptoms include not only a sad and morbid outlook but also guilt feelings, indecisiveness, loss of interest, and apprehension. The physical symptoms include loss of weight and a variety of functional disorders. If their nature is understood, the necessary treatment by psychotherapy, electroshock, or analeptics can be given. Sedatives and tranquilizers have no beneficial effect on the depression; some aggravate it. The danger of suicide must be kept in mind. Depression is a most distressing illness, but the prognosis is good. The patient must be encouraged by the interest and understanding of the physician. There is no greater satisfaction than to see a depressed patient restored from the depths of despair to a normal, happy life.

Next to anxiety-tension states, depression is the commonest type of neurosis seen in general practice. A depression is primarily a mood disturbance, with many physical concomitants. The physical symptoms may so dominate the clinical picture as to mask the true nature of the patient's illness. The physician who is not alert to the possibility of an underlying depressive reaction may be led into many a diagnostic and therapeutic blind alley.

When a depression is caused by an unhappy experience, it is called an exogenous or reactive depression. When it occurs spontaneously, for no apparent or adequate reason, it is termed an endogenous depression and is considered to be a manifestation of the manic-depressive disorders. It is characteristic of endogenous depressions that the patient feels worse in the morning and better in the afternoon and evening. In my experience, both types of depression occur with about equal frequency, and, of course, many patients present a mixture of exogenous and endogenous factors.

Clinical Diagnosis

In many cases, the diagnosis of a depression will be obvious from the patient's own statements and demeanor. In many other cases, however, the depressive nature of the illness will not be recognized by either the patient or the doctor unless the latter judiciously questions the patient for the typical symptoms of this disorder. These symptoms may be divided into physical and mental.

Mental Symptoms.—The mental symptoms may be grouped into five divisions. 1. Depressed spirits. The patient has a morbid, hopeless outlook, with crying spells and suicidal ideas. 2. Guilt feelings. The patient blames himself for everything and feels inferior, inadequate, and unworthy. He thinks himself a failure and broods over imagined or minor mistakes. 3. Difficulty in concentrating. The patient is absent-minded, cannot make decisions, cannot read, and fears he is losing his mind. 4. Loss of interest. The patient has no zest or enthusiasm. He neglects himself and his work and has to make himself do things. 5. Apprehension. The patient has exaggerated fears and worries about everything, especially the future. The depression may not be the presenting symptom, as is demonstrated by the following cases.

CASE 1.—A 33-year-old housewife wanted to place her children in a home and divorce her husband because of a false feeling of failure as a wife and mother. Recognition of the underlying depression and consequent successful treatment prevented a marital tragedy.

From the Department of Psychiatry, University of Washington School of Medicine.

Read before the 10th Clinical Meeting of the American Medical Association, Seattle, Nov. 27, 1956.

CASE 2.—A 46-year-old salesman literally worried himself sick over having improperly listed a $5 nonbusiness expense as tax deductible. His exaggerated feelings of guilt and hopelessness over the situation made the diagnosis of depression obvious.

CASE 3.—A 56-year-old housewife, for no apparent reason, insisted on selling her home after many happy years and purchased another house. She disliked the new house and became critically ill when she was unable to buy back her old home. The initial dissatisfaction and subsequent indecision made the diagnosis and treatment of depression possible.

Physical Symptoms.—The physical symptoms may be grouped into four divisions. 1. Loss of appetite and weight. Food nauseates the patient. He has a coated tongue and suffers from constipation and flatulence. He has usually lost 20 or 30 lb. (8 or 12 kg.) in weight. 2. Insomnia. The patient's insomnia is often severe and intractable. 3. Fatigue. The patient, whose fatigue is often worse in the morning, wakes up feeling more tired than when he went to bed. Often this feeling of fatigue is greater than that produced by organic illness. 4. Nervous tension. Nervous tension is especially pronounced in agitated or tension depressions and in multiple psychosomatic complaints.

The physical symptoms of depression may be more prominent than the mental symptoms, as illustrated by the following causes.

CASE 4.—A 26-year-old schoolteacher had her teeth pulled and her facial nerve injected several times before it was recognized that the pain in her face and jaws was due to a depression. After an attempted suicide, she was given electroshock treatments, with relief from the pain and the depression.

CASE 5.—A 45-year-old steelworker was treated for 10 months for sexual impotency, urinary frequency, and bladder pain without apparent organic basis. After it had been elicited that he had feelings of depression with crying spells, the true diagnosis was finally established.

Treatment

Unfortunately, no drug has been developed that will satisfactorily relieve depression. Such stimulants as the amphetamines (dextro amphetamine [Dexedrine] sulfate and methamphetamine [Desoxyn, Methedrine] hydrochloride), pipradrol (Meratron) hydrochloride, and methylphenidate (Ritalin) hydrochloride are the most helpful and often give some measure of relief in mild cases. At best, however, they leave much to be desired from the standpoint of sustained adequate elevation of mood.

Sedatives and tranquilizers may bring some relief for the often associated tension and anxiety, but they have no effect whatsoever on the depression. Reserpine, and perhaps chlorpromazine hydrochloride, may even aggravate the depression. Combinations of stimulants and sedatives or tranquilizers, such as Dexamyl (dextro amphetamine and amobarbital) or Thoradex (chlorpromazine and dextro amphetamine), are usually more effective than either alone. Sedatives for sleep at night and vitamins and frequent, small, high-calorie feedings for maintenance of nutrition are usually indicated.

Because of the relative inadequacy of drugs, the main attack on this disease still has to be psychotherapeutic. In the treatment of reactive depressions, the comforting encouragement, the understanding sympathy, and the wise advice of a trusted physician are most helpful. This, plus the healing passage of time, will see most patients through their illness. Even when nothing can be done about a continued hopeless situation, the opportunity to unburden himself to his doctor often brings the patient moral support and the courage to carry on.

Psychotherapy of the spontaneous or endogenous depressions hinges on the fact that depressive attacks are usually self-limited. Almost all of these patients will recover within a few months' to a year's time, regardless of the type of treatment used. Although some depressed patients will have one or more subsequent attacks during their lifetime, the prognosis for any given attack is excellent. The physician must seize on this favorable prognosis to assure the patient that his condition is temporary and that he will get well.

Constant, emphatic, and authoritative assurances of eventual recovery must be impressed on the patient; otherwise he may not have the courage to fight through what is perhaps the most painful of all illnesses. Suicide is the great risk in depressions, and often the patient's faith in his doctor's promise that he will again be well and happy is the only thing that will keep him from ending his life. The physician should warn the relatives about the possibility of suicide, so that such things as guns or large amounts of sedatives may be kept away from the patient. The physician should never, of course, write a prescription that would make a lethal amount of a sedative available to a depressed patient unless a relative will take responsibility for handling the medicament. Although no one can accurately predict which patients will attempt suicide, the opinions of relatives will often be helpful in this respect. Suspected imminence of suicide or a depression lasting longer than nine months are indications for electroshock treatment. Electroshock is the most effective therapy available for severe endogenous depressions and may be lifesaving.

Most depressed people have an exaggerated sense of guilt. The physician should take advantage of this to discuss these feelings as well as any other personal problems that the patient may be prompted to bring up for discussion. Because he already feels unworthy, admonitions to the patient that he could get well if he wanted to and exhortations to increased activity only serve to drive him deeper into his depression. Continued patient encouragement is the best help anyone can give a depressed person.

Because of the morbid thoughts and the difficulty in concentrating or making decisions, many depressed patients fear that they will become insane. They can be reassured on this score by the explanation that this illness is an emotional and not a mental disorder and that they will not lose control of their faculties.

It should also be explained to the patient that recovery from a depression is an up-and-down proposition rather than a smoothly progressive convalescence such as usually occurs with organic disease. More and more "good" days and fewer and fewer "bad" days are experienced, until finally all the days are "good" days again. Unless a patient understands this, he is apt to feel he has slipped back to where he started from when he has a "bad" day. Because of this, he may lose heart and his progress be delayed.

Many patients will ask how long they are going to be ill. Inasmuch as it is impossible to foretell with any certainty the duration of a depression, it is best not to commit oneself on this. I tell most patients that no one can say just how long they will be ill but that with nervous exhaustion it usually takes several months before the nervous system can be built up to the point where they will feel like their normal selves again.

Conclusions

Although depression is one of the most distressing illnesses that a doctor is called upon to treat, it may be one of the most rewarding. Because the illness is usually self-limiting, almost all depressed patients will eventually recover. If the doctor has been patient and understanding enough to see the patient through his ordeal, he, the doctor, will get the credit for the cure. There can be no more grateful patient or relatives, nor is there any greater satisfaction than to see a patient restored from the depths of despair to a normal happy life. Most people who are subject to depression are, when well, some of the finest, warmest, and most conscientious and productive people in the community.

308 Medical and Dental Bldg. (1).

BRONCHOGRAPHY IN THE DIAGNOSIS OF PEDIATRIC PROBLEMS

Charles F. Ferguson, M.D.
and
Carlyle G. Flake, M.D., Boston

• *Exact and early diagnosis of bronchopulmonary abnormalities in children is important because some conditions formerly irremediable can now be corrected surgically. Tracheoesophageal fistula, for example, can and should be repaired before chronic pneumonitis develops. Diagnosis of tracheoesphageal fistula without esophageal atresia by endoscopic means alone is difficult, but it is rendered easier and more precise by combining bronchoscopy and bronchography under general anesthesia in the technique here outlined. In bronchography for other conditions, iodized oil is injected by catheter through an endotracheal tube under fluoroscopic control, and each lobe is filled as the patient is turned into various positions. After the desired roentgenograms have been obtained, the oil is removed by aspiration. The causation of stridor, persistent atelectasis, and other abnormalities may thus be explained. Recent advances in intrathoracic surgery, especially about the aortic arch, have made it possible to eradicate the cause of the symptoms in many such cases.*

In recent years bronchography has become increasingly useful in the solution of many perplexing bronchopulmonary problems of infancy and childhood. Early, accurate diagnosis is of the greatest importance if the patient is to receive maximum benefit from the progress which has taken place in the field of pediatric thoracic and cardiovascular surgery.

The clinical symptoms which should alert the physician to the probable need for a more thorough chest examination than can be accomplished by the stethoscope and routine roentgenographic studies alone are (1) chronic pulmonary changes which can be demonstrated by the usual roentgenographic studies; (2) unexplained chronic cough, whether productive or nonproductive; (3) stridor, which is often erroneously presumed to be laryngeal in origin; (4) recurring infection in the same area of the lung; (5) persistent or recurring wheezing emanating from the same area of the lung; and (6) hemoptysis (not, in our experience, commonly observed in childhood, but, when seen, usually associated with severe pulmonary pathology).

The medical management of chronic pulmonary infection is greatly facilitated by bronchography. It not only assists in the establishment of a correct diagnosis and indicates the extent of the disease but also records the clinical courses of such patients to determine the efficacy of treatment by the different antibiotic agents.

Bronchiectasis

Bronchiectasis has always been considered a serious disease in childhood, yet today many patients are being treated successfully by medical therapy alone. Before such treatment is undertaken, an accurate evaluation of the condition of the tracheobronchial tree should be carried out. In our opinion, in addition to the usual roentgenographic studies, this evaluation should include careful bronchoscopy, bacteriological and fungus studies of the pulmonary secretions, with sensitivity tests, and bronchography.

While all of the factors in the etiology of bronchiectasis are not known, most observers are agreed that the pathological changes noted are chiefly the result of prolonged bronchial obstruction plus infection. In childhood, bronchiectasis is often preceded or accompanied by a number of conditions in which these factors are prominent features. Among the more common conditions are unresolved pneumonia (fig. 1), persistent atelectasis (particularly that involving the middle lobe), pertussis, recurrent attacks of bronchitis and sinusitis, and severe asthma. Less common causes, in our experience, have been mucoviscidosis (fibrocystic disease of the pancreas) (fig. 2 *A*), foreign-body aspiration (fig. 2 *B*), and stenosis of a bronchus. In such

---

Read before the Section on Laryngology, Otology and Rhinology at the 104th Annual Meeting of the American Medical Association, Atlantic City, N. J., June 8, 1955.

From the departments of otolaryngology, Childrens' Medical Center and Harvard Medical School.

instances, however, the bronchiectasis may be very severe. Anomalies of the tracheobronchial tree occur with much greater frequency than has been generally suspected in the past.[1] We have observed bronchiectasis associated with various anomalies, including those of the right upper lobe bronchus where the bronchus arises from the trachea just above the bifurcation and is often twisted or partially stenosed. Congenital stenosis of a normally situated bronchus has been noted on several occasions. Weakness, severe malformation, or even absence of bronchial cartilages have been observed in the main bronchi of young patients with bronchiectasis. Thus, whenever the factors of infection and obstruction are found as a chronic condition, bronchiectasis is commonly seen.

Agenesis of the Lung

An infant or young child who presents signs of dulness, whose breath sounds are absent, and who may or may not have displacement of the mediastinum recognized clinically or roentgenographically may be suspected of having unresolved pneumonia or atelectasis. On occasions, such findings may indicate agenesis of the lung, and in such instances bronchography is of great assistance in establishing a correct diagnosis.[1] In most cases this condition is relatively

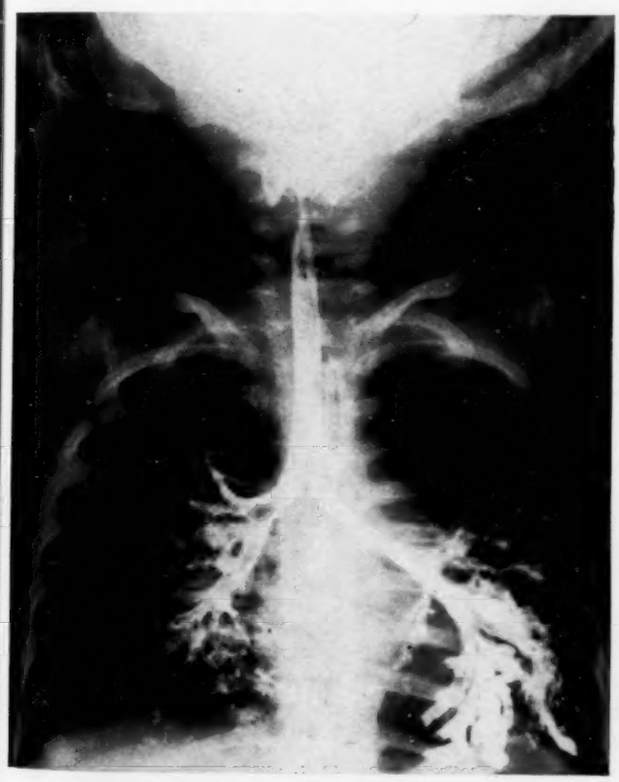


Fig. 1.—Bronchiectasis of left lung after unresolved pneumonia (anteroposterior view). Marked saccular dilatation is apparent in lower lobe.

asymtomatic, so that the pediatrician should be aware of the possibility of such an anomaly when he is confronted with an abnormality of the lung field that is not completely satisfactorily explained otherwise. Other multiple congenital defects are usually associated with agenesis of the lung, and they may serve to arouse suspicion of the proper diagnosis.

Agenesis of the lung may be of three types: (1) true aplasia, with no trace of lung, bronchus, or vascular supply; (2) tiny outpocketing, or bud of the trachea, with no lung tissue; and (3) extreme hypoplasia of the bronchus, with no true lung tissue (fig. 3).

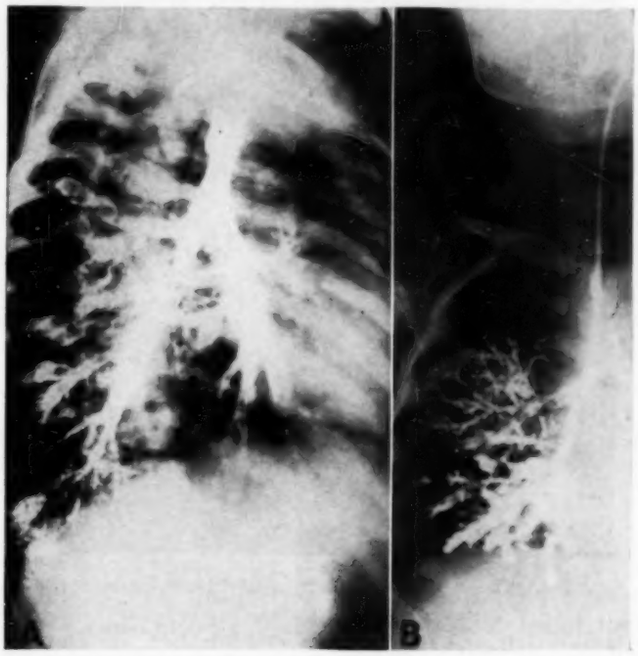


Fig. 2.—*A*, generalized bronchiectasis associated with mucoviscidosis (oblique view with right bronchus injected). *B*, bronchiectasis of right lower lobe after aspiration of timothy grass—top (anteroposterior view).

Tracheoesophageal Fistula

Tracheoesophageal fistula is an important congenital anomaly that is frequently observed at large pediatric centers, yet it may be difficult to recognize. In most cases, the fistula is associated with atresia of the esophagus, and difficulties will be obvious from the first attempt at feeding. The diagnosis should be made promptly. However, in patients where the esophagus is patent, a tracheoesophageal fistula may give no symptoms except recurrent attacks of pneumonitis of the aspiration type.[2] Choking on liquids rather than solid food, in a person with or without persistent loose cough, may arouse suspicion; but usually it is not until later in infancy or childhood that the correct diagnosis is made. In such cases, bronchography may be of great help in delineating the fistula if it has not already been demonstrated fluoroscopically by means of swallowing of a contrast medium. It is very difficult to visualize such a fistula endoscopically, even with the Broyles telescope. Early diagnosis is important, so that the fistula can be repaired surgically before the development of chronic pneumonitis with resultant fibrosis or bronchiectasis (fig. 4).

Stridor

Stridor is an extremely common condition in infancy, and in the past the larynx was regarded as the usual site of its origin. Now we know it is by no means the only one. Stridor must be regarded as merely a symptom, and its cause must be adequately determined in each case. In the presence of a normal

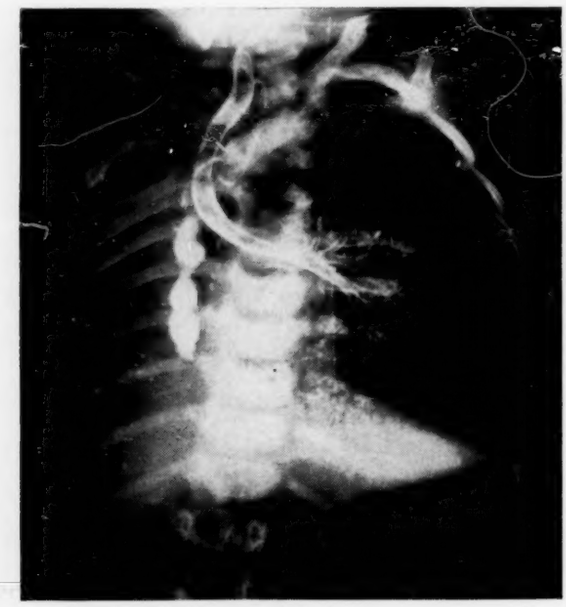


Fig. 3.—Agenesis of right lung (anteroposterior view).

larynx, the true cause of the stridor may be found only by careful evaluation of the tracheobronchial tree. Bronchoscopic examination may show a true stenosis of the trachea, which is indistinguishable roentgenographically from an apparent narrowing due to a glottic obstruction. In the latter case, the narrowing is present only during the phase of inspiration and will disappear when the glottis is held open by an anterior-commissure laryngoscope. Thus it is a transient physiological obstruction and not due to a fixed anatomic narrowing. Abnormalities of the epiglottis or of the arytenoepiglottic folds are usually responsible for this condition. If the cartilaginous framework of the trachea is deficient, local collapse of a segment of the trachea or bronchus will occur during each respiratory cycle. Stridor, dyspnea, or even cyanosis may result, along with intercostal, suprasternal, and infrasternal retraction. This may be seen endoscopically and recorded graphically by serial tracheograms or bronchograms. By the use of special equipment, 15 to 20 films may be exposed in rapid succession during several respiratory cycles. The abnormal area can be seen to change its caliber if there is a local deficiency of the tracheal cartilages.

By far, the commonest extralaryngeal causes of stridor are to be found, however, in patients who have a compression of the trachea by an abnormal aortic arch, with or without malformation of the great vessels.[3] The earliest and most severe symptoms of tracheal obstruction and stridor are usually seen in infants who have a double aortic arch, the commonest type of vascular ring. In such cases, both the right and left fourth embryonic arches persist and encircle the trachea and esophagus. This usually produces symptoms of a distressing type before the infant is 6 months of age. These babies have severe respiratory embarrassment, stridor which is both inspiratory and expiratory in phase, dyspnea, wheezing, retractions, and attacks of cyanosis. Dysphagia is common, or more often merely a "hesitation" in swallowing is noted. Bronchoscopic examination of such infants reveals a compression of the lower portion of the trachea at the level of the third or fourth thoracic vertebra, and, as visualized by barium studies, the esophagus is also constricted at this same level (fig. 5). In the absence of a mediastinal mass, such a picture of constriction of both the trachea and esophagus at the same level is pathognomonic of some type of vascular ring. Today, successful division of such a ring can be carried out by a competent thoracic surgeon, giving complete relief of the infant's symptoms.[4] The diagnosis, however, must be made as early as possible, before permanent damage is done to the already constricted and badly deformed cartilages.

Similar symptoms may be produced by another type of ring, due to a right-sided aortic arch with a constricting ligamentum arteriosum. Such patients will usually live for 12 to 18 months before symptoms be-

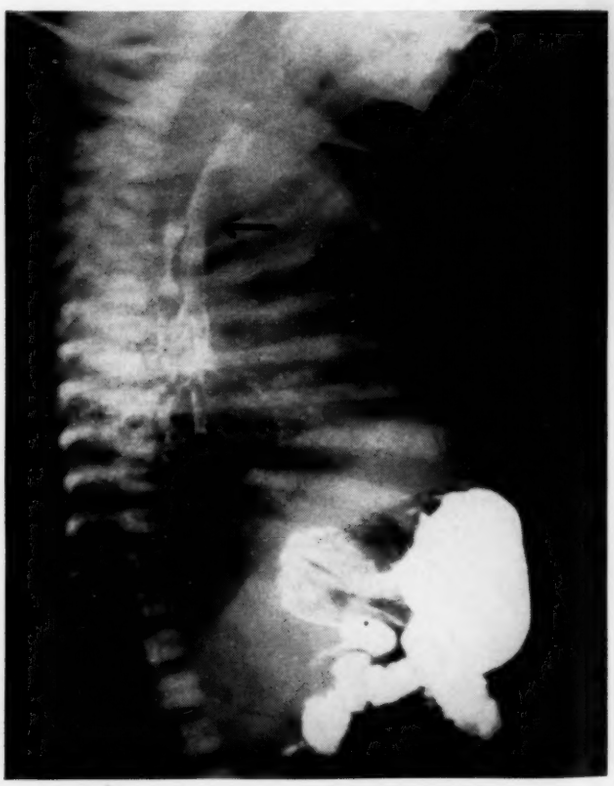


Fig. 4.—Tracheoesophageal fistula without atresia of esophagus (lateral view).

come apparent. The time when symptoms appear, however, will depend on the length and tightness of the ligamentum. The ligamentum is the remains of the ductus arteriosus, which connects the pulmonary ar-

tery anteriorly to the first portion of the aorta posteriorly. Therefore, if the arch of the aorta is placed on the right side, the ductus arteriosus (or ligamentum) must of necessity curve around the left side of the trachea and esophagus and, in most instances, posterior to it. This completes a constricting ring. In such cases the left subclavian artery may run posterior to the esophagus and cause additional compression. Anomalies of the innominate artery or left common carotid artery may cause an anterior compression of the tracheal wall with resultant stridor and signs of obstruction. Here, however, there are no esophageal symptoms, and barium studies of the esophagus show an adequate lumen throughout. Such conditions will result if the innominate artery arises too far to the left on the aortic arch, or if the left common carotid arises

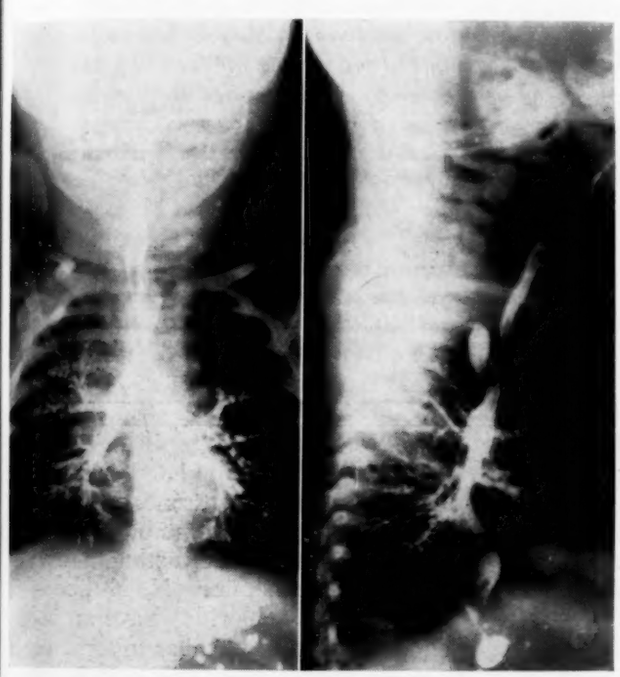


Fig. 5.—Double aortic arch. *Left*, anteroposterior view. Constriction of both trachea and esophagus at same level is shown. *Right*, lateral view showing "pinchcock" effect of compression ring.

too far to the right, thereby crossing the trachea anteriorly. Each of these defects can be corrected surgically and the compression relieved.

Technique

At the Children's Medical Center in Boston, most of our tracheographic and bronchographic studies are performed with the patient under general anesthesia. This technique has been described in more detail elsewhere.[3] Premedication with pentobarbital (Nembutal) and atropine is followed by the administration of vinyl ether (Vinethene) and ether anesthesia, using the open mask method. On occasion, in older children, basal anesthesia with rectally given tribromoethanol (Avertin) is used instead of pentobarbital premedication. A complete bronchoscopic examination is made, during which secretions are aspirated into a Lukens tube, for bacteriological and fungus cultures. Sensitivity tests against the various antibiotic agents are always carried out. After completion of the bronchoscopic procedure, an endotracheal tube is inserted. Under fluoroscopic control, iodized oil (Lipiodol) is injected via a polyethylene catheter inserted through the endotracheal tube. Each lobe is filled under direct vision, as the patient is turned into various positions. When satisfactory filling has been completed, five routine views are obtained (namely, an anteroposterior, a lateral, and three oblique views). The oil is then aspirated and the endotracheal tube removed. The amount of oil employed varies with the size of the patient. From 1 to 2 cc. is used in a small infant when it is desired to outline only the trachea. It may be necessary to use 15 to 20 cc. in an older child with bronchiectasis. The patient should be kept at just the right stage of anesthesia, so that the cough reflex will be suppressed for three or four minutes to allow the films to be completed. Teamwork, involving the anesthesiologist, the radiologist and his technician, and the endoscopist, is essential for satisfactory results.

Summary

Bronchographic studies are necessary for accurate diagnosis of many bronchopulmonary problems in infants and children. Such studies are especially helpful in determining the presence and degree of bronchiectasis and are also of great value in recording and evaluating progress during medical treatment. Bronchiectasis is usually associated with a number of conditions in which the factors of infection and obstruction are the most prominent features. The possibilities of agenesis of the lung and tracheoesophageal fistula without esophageal atresia should be considered in patients with abnormal pulmonary findings. Stridor, usually considered as emanating from the larynx alone, may be due to stenosis of the trachea, to external compression of the trachea, or to stenosis of a main bronchus. It is especially severe in patients who have anomalies of the aortic arch or great vessels that produce external tracheal compression. This type of anomaly is now amenable to surgery.

300 Longwood Ave. (15) (Dr. Ferguson).

References

1. Ferguson, C. F., and Neuhauser, E. B. D.: Congenital Absence of Lung (Agenesis) and Other Anomalies of Tracheobronchial Tree, Am. J. Roentgenol. **52**:459-471 (Nov.) 1944.

2. Ferguson, C. F.: Congenital Tracheoesophageal Fistula Not Associated with Atresia of Esophagus, Laryngoscope **61**:718-766 (Aug.) 1951.

3. Ferguson, C. F., and Flake, C. G.: Tracheographic and Bronchographic Studies as Aids in Diagnosis of Congenital Malformations of Tracheobronchial Tree and Aortic Arch in Infants and Children, Ann. Otol. Rhin. & Laryng. **63**:1056-1081 (Dec.) 1954.

4. Gross, R. E., and Neuhauser, E. B. D.: Compressions of Trachea and Esophagus by Vascular Anomalies: Surgical Therapy in 40 Cases, Pediatrics **7**:69-88 (Jan.) 1951.

5. Flake, C. G., and Ferguson, C. F.: Tracheography and Bronchography in Infants and Children, Pediat. Clin. North America **2**:279-289 (Feb.) 1955.

MECHANISM OF INFLAMMATION AS RELATED TO SURGICAL MANAGEMENT AND GENERAL RESISTANCE

William P. Herbst, Washington, D. C.

• *Three cases involving elderly patients are described to illustrate the effectiveness of orally administered corticoids in increasing general resistance to recurrent infections and to surgical shock. An 85-year-old man who had gone into profound shock after catheterization subsequently underwent the first and second stages of suprapubic prostatectomy without reactions with the help of maintenance doses of cortisone. A 78-year-old man went into profound shock after the third of a series of operations, but was maintained on doses of hydrocortisone not exceeding 50 mg. per day until death resulted from the rupture of an aortic aneurysm. A 50-year-old woman had been hospitalized repeatedly for recurring pyelonephritis unaffected by antibiotics and chemotherapy; recurrences stopped when cortisone was administered in doses of 2.5 mg. daily by mouth. Antibiotics and chemotherapy should always be used along with corticoid medication, and their use should be continued for a time after corticoid medication has been stopped. It is important to adjust the dosage of corticoids so as to avoid the gastrointestinal necrosis, delayed healing, and upset of electrolyte balance that have been reported after the use of large doses.*

Advanced knowledge in the field of homeostasis as related to general resistance, shock, the general adaptation syndrome, and the mechanism of inflammation has resulted in the saving of many lives which would otherwise have been lost. The problem of general resistance as related to frequently recurring pyelonephritis and cystitis is another field in which basic biochemical factors related to inflammation afford principles which may be constructively utilized.

Homeostasis is defined by Cannon as "Maintenance of steady states by coordinated physiological processes." [1] The maintenance of steady states involves the environment and the sum total influence of individual cell metabolism. Shock, although very complex, exerts its chief destructive effects through anoxia and will be discussed only in connection with the maintenance of satisfactory blood pressure levels. The general adaptation syndrome, as described by Selye,[2] has provided one of the most satisfactory explanatory schemes of clinical phenomena that anyone has presented in recent times. Exhaustion is frequently synonymous with death. The contraction of the heart muscle is supposed to depend on the presence of a lipid steroid chemical substance related chemically to toad venom.[3]

Clinical Management

The first International Symposium on the Mechanism of Inflammation was held in conjunction with the 19th International Physiological Congress in September, 1953, at Montreal, Canada. Instead of extensive reference to the transaction of this conference, a few of the pertinent observations which have clinical management potentialities will be presented.

Ungar [4] presented a schematic representation involving the fibrinolytic mechanism which indicates that histamine elaborated in a stage of proteolysis produces (1) vasodilation, (2) stasis, and (3) increased vascular permeability. This presentation, as well as the contributions of Carson and Campbell,[5] Duran-Reynals,[6] Judd and Henderson,[7] Kindall and Nickels,[8] Mayer and Kull,[9] Rich and Lewis,[10] and me,[11] provides the rationale behind the clinical use of antihistamines in acute infectious inflammatory lesions.

Menkin [12] studied the effect of anti-inflammatory substances on isolated cellular systems. He used the ova of the sea urchin. Keeping them in sea water with a small amount of cortisone for 15 minutes and then fertilizing them brought about cell division. Variations in incidence of cleavage were used as an indication of variations in cell activity. Cortisone, hydrocortisone, and corticotropin produced a depressing effect. Somatotropic hormone did not.

From the Department of Urology, Georgetown University Medical School.

Read before the Section on Urology at the 105th Annual Meeting of the American Medical Association, Chicago, June 12, 1956.

Taubenhaus [13] observed that somatotropic hormone, thyroxin, and desoxycorticosterone stimulated granulation tissue and that cortisone, hydrocortisone, estrogen, testosterone, and methylandrostenediol inhibited granulation tissue. He also observed that methantheline bromide (Banthine) and Dibenamine (N, N-dibenzyl beta-chloroethylamine hydrochloride) have an inhibiting effect on granulation tissue similar to some of the corticosteroids.

There are many other observations in the "Mechanism of Inflammation" for which space will not permit further reference. I suggest that a reading of this book is most rewarding.

Report of Cases

In the field of general resistance we are confronted with the problem of how to make infrequent the incidence of such recurring acute infectious entities as pyelonephritis and cystitis.

We know very little about resistance except that it is considered to be low after exhaustion, emotional shock, chilling, and wetting and when the hemoglobin level or red blood cell count is low. The possible relationship of steroids to general resistance is important and will be referred to later.

Three clinical cases illustrative of general resistance follow.

CASE 1.—An 85-year-old man had experienced recurring pyuria with fever, frequency, urgency, and varying amounts of residual urine for more than a year and had refused any surgical intervention. On May 30, 1955, he gave a history of recent hematuria, chills, pains in the penis, and inability to void. He

was hospitalized, and catheterization produced 160 cc. of bloody, infected urine. His temperature rose to 105 F (40.6 C) in less than an hour. The blood pressure dropped to 70 mm. Hg. He was in profound shock.

He was started immediately on therapy with levarterenol (Levophed) bitartrate in distilled water; in addition, 500 mg. of tetracycline (Achromycin) and 50 mg. of hydrocortisone were given intravenously. The levarterenol administration was continued periodically for three days because his blood pressure would not stay up. Cortisone was given orally, 25 mg. twice a day, until June 8, 1955, on which day suprapubic cystostomy was performed without incident. On June 14, a second-stage prostatectomy was carried out. The patient had no reaction to the operation.

He left the hospital on the 10th postoperative day. During his convalescence he was at first given 25 mg. of cortisone a day and then was placed on maintenance therapy with 10 mg. a day; when he left the hospital the maintenance dosage was reduced to 5 mg. a day. In conjunction with this he was given antibiotics continuously, and, very important, they were continued after the cortisone was withdrawn.[14]

Case 2.—A 78-year-old poor-risk male had had a very narrow escape from death after biliary surgery. He had developed an obstruction in the neck of the bladder, and an indwelling catheter was necessary during the three-month postoperative period. He was to undergo a suprapubic prostatectomy whenever he was considered sufficiently recovered to do so. However, the incision for such surgery revealed a peculiar hemorrhagic blood factor which made it unwise to proceed. Blood studies failed to disclose the reason for this bleeding problem. Vitamin B_{12} in doses of 100 mcg. daily was given for the week after the cystostomy on the basis of previous observations that such therapy seems to be helpful in certain bleeding problems.

A second-stage suprapubic prostatectomy was carried out one week after the cystostomy, and no untoward incident occurred during surgery. The patient did have an unusually large gland, and because of his previous bleeding experience the capsule was packed with iodoform gauze for hemostasis. He got along very satisfactorily from the prostatectomy. However, after the removal of the packing on the fifth postoperative day, his blood pressure went down to practically nothing and he suffered profound shock and had to be immediately resuscitated with oxygen and intravenous doses of levarterenol. He was given blood transfusions, 50 mg. of hydrocortisone, and intravenous doses of tetracycline and pencillin. He was given 25 mg. of diphenhydramine (Benadryl) hydrochloride by hypodermic injection.

After this initial episode, which demanded levarterenol for four days, his electrolytic balance was continuously all right and he was on maintenance therapy with antibiotics, vitamins, and blood given intravenously. He was critically ill for three weeks, with one week of total unconsciousness. On numerous occasions the nurses felt that it was not possible for him to survive another hour. He regained consciousness, however, and appeared to be well on the road to recovery when an aortic aneurysm ruptured and resulted in instant death. An autopsy demonstrated that he had had multiple miliary renal abscesses bilaterally, which were in various stages of resolution. The dosage of hydrocortisone had not exceeded 50 mg. per day nor more than 25 mg. of diphenhydramine when that was given. The last week the dose had been tapered off to 25 mg. of cortisone orally.

Case 3.—A 50-year-old woman was often hospitalized for prolonged, frequently recurring pyelonephritis. She was seen in consultation in the hospital in an acute pyelonephritic attack in September, 1944. From 1944 until April, 1953, she was hospitalized with recurrence of these acute, febrile, bilateral pyelonephritis and cystitic problems because of the inability to control the infection with the customary supportive chemotherapeutic vitamin and antibiotic therapy.

Upon discharge on April 28, 1953, she was put on therapy with cortisone, 2.5 mg. orally daily. On May 15, 1953, she reported that she was feeling fine and gaining weight. By June 15, 1953, she had gained 5 lb. (2.3 kg.). From that date until February, 1956, at which time she moved to California, she took cortisone, 2.5 mg. per day, whenever she felt herself "slipping." She would take it from periods of anywhere from one week to six weeks at a time.

Use of Antihistamines and Corticoids

There are certain aspects concerning the use of antihistamines and corticoids that should be discussed. Very important is the fact that antibiotics or chemotherapeutic agents should always be used along with corticoids.[13] This is not important in the administration of antihistamines.[11a]

The dosage to be used is very important, because much larger doses than are necessary or advisable are very frequently used and because small doses, meaning doses from 1 to 25 mg. of any of the corticoids, do not influence the electrolytic balance to any appreciable degree. There has been considerable comment on the production of perforating gastrointestinal ulcers after the administration of the corticoids. These accidents do occur, but they occur in the patients who are given large doses of from 50 to 300 mg. per day.

There is also the criticism of interference with healing. In the surgical procedures carried out for bilateral adrenalectomy, really large doses of cortisone are given preoperatively and postoperatively with no difficulty in wound healing. There should be no reason for anyone's not realizing that large dosages, that is, over 50 mg. per day, would almost certainly upset homeostasis and possibly unfavorably so. In addition, it is noteworthy that 1 mg. of estradioldipropionate produced a most spectacular clinical response the first time it was used in the treatment of advanced metastatic carcinoma.[15] It is unreasonable to feel that 5 mg. of any corticoid would seriously upset homeostatic balances.

In regard to antihistamines, tripelennamine (Pyribenzamine) hydrochloride has been used in doses of 50 mg. one to three times a day. Diphenhydramine is given in 25-mg. doses orally or by injection from one to three times a day.

It is noteworthy that many anesthetists use diphenhydramine and hydrocortisone by injection[16] both during the operation and in the early postoperative recovery period. For patients who have frequently recurring infectious inflammatory lesions of the urinary tract, doses of the corticoids vary anywhere from 1 mg. of prednisolone to 2.5 mg. of cortisone without any untoward reaction. The reports that one receives of the patients' own observations of the influence of these small doses of cortisone are very impressive. Recently I saw a patient who had been on therapy with 1 mg. of prednisolone for a month after dismissal from the hospital for an acute pyelonephritis and cystitis attack. She stated that for the whole month that she took the prednisolone she felt fine and that when the drug was withdrawn she did not feel nearly so well and that, moreover, two months later she had mild recurrence of cystitis.

Summary

There are available spectacularly effective pharmaceutical agents which successfully prevent death in conditions of severe shock, acute infectious inflammatory lesions, and general resistance deficiencies. Whenever corticoids are administered, antibiotics or chemotherapeutic agents should be administered along with them and their administration continued after the

corticoids are withdrawn. The frustrating problem of frequently recurring infectious inflammatory entities shows promise of being satisfactorily controlled by the judicious administration of small doses of corticoids and antihistamines. Our rapidly increasing knowledge of the metabolic processes that occur in individual cells will probably hold the answer to innumerable improvements in what is already a very inspiring and promising field of therapeusis.

1801 Eye St. N. W. (6).

The patient in case 1 is reported with the permission of Dr. William P. Herbst III.

References

1. Cannon, W. B.: Wisdom of the Body, ed. 2, New York, W. W. Norton & Company, Inc., 1939.

2. Selye, H.: Physiology and Pathology of Exposure to Stress: Treatise Based on Concepts of General-Adaptation-Syndrome and Diseases of Adaptation, Montreal, Acta, Inc., 1950.

3. Shannon, J. A.: Personal communication to the author.

4. Ungar, G., in Mechanism of Inflammation: International Symposium, Montreal, Acta, Inc., 1953.

5. Carson, L. E., and Campbell, C. C.: Inhibitory Effect of Three Antihistaminic Compounds on Growth of Fungi Pathogenic for Man, Science **111**:689-691 (June 23) 1950.

6. Duran-Reynals, F.: Tissue Permeability and Spreading Factors in Infection: Contribution to Host: Parasite Problem, Bact. Rev. **6**:197-252 (Dec.) 1942.

7. Judd, A. R., and Henderson, A. R.: Use of Antihistaminic Drugs in Human Tuberculosis: Preliminary Report, Ann. Allergy **7**:306-317 (May-June) 1949.

8. Kindall, L., and Nickels, T. T.: Allergy of Pelvic Urinary Tract in Female: Preliminary Report, J. Urol. **61**:222-232 (Feb.) 1949.

9. Mayer, R. L., and Kull, F. C.: Influence of Pyribenzamine and Antistine upon Action of Hyaluronidase, Proc. Soc. Exper. Biol. & Med. **66**:392-398 (Nov.) 1947.

10. Rich, A. R., and Lewis, M. R.: The Nature of Allergy in Tuberculosis as Revealed by Tissue Culture Studies, Bull. Johns Hopkins Hosp. **50**:115-131 (Feb.) 1932.

11. Herbst, W. P.: (*a*) Antihistamine—Possible Relationship to Other Factors Influencing Infection, J. Urol. **66**:433-434 (Sept. 3, 1951); (*b*) Metabolic Aspects of Resistance and Inflammation as Related to Urologic Surgical Management, South. M. J. **48**:854-857 (Aug.) 1955.

12. Menkin, V., in Mechanism of Inflammation: International Symposium, Montreal, Acta, Inc., 1953.

13. Taubenhaus, M., in Mechanism of Inflammation: International Symposium, Montreal, Acta, Inc., 1953.

14. Kinsell, L. W., and Jahn, J. P.: Use of Corticoids in Association with Antibiotics in Management of Unusually Severe Infections, Ann. New York Acad. Sc. **61**:397-407 (May 27) 1955.

15. Herbst, W. P.: Effects of Estradiol Dipropionate and Diethyl Stilbestrol on Malignant Prostatic Tissue, Tr. Am. A. Genito-Urin. Surgeons **34**:195-202, 1941.

16. Stubbs, D.: Personal communication to the author.

COMPRESSION NEUROPATHY OF THE MEDIAN NERVE IN THE CARPAL TUNNEL

George S. Phalen, M.D.
and
James I. Kendrick, M.D., Cleveland

• *The median nerve as it leaves the forearm passes through the carpal tunnel in order to reach the hand. Within the tunnel it is subject to compression by neighboring structures because of space limitations imposed by the transverse carpal ligament. The resulting symptoms have been studied in 71 patients; they were bilateral in 39 and unilateral in 32. The right hand was affected in 23 and the left hand in only 9 of the unilateral cases. Seventeen patients were men. Diagnosis depended on sensory findings (pain and paresthesias) limited to the distribution of the median nerve in the hand, on prompt exacerbation of symptoms when the wrist was held in the flexed position, and on the production of tingling in the fingers by percussion over the carpal tunnel. Atrophy of thenar muscles was present in half the cases. Etiological and pathological findings favored the conception of this disorder as some type of localized rheumatic disease. Immobilization of the wrist by a splint and administration of hydrocortisone relieved the symptoms in many cases. Surgery, the simple sectioning of the transverse carpal ligament, was carried out on 49 wrists in 37 patients and generally sufficed to decompress the nerve and relieve symptoms. In three instances, however, a partial synovectomy had to be done in order to obtain adequate decompression.*

As the median nerve passes down the volar aspect of the forearm and enters the carpal tunnel, it lies immediately beneath the transverse carpal ligament and on top of the flexor tendons of the fingers (fig. 1). Any alteration in the contour of the carpal tunnel or any increase in the volume of the contents of the carpal tunnel can easily compress the median nerve against the transverse carpal ligament, producing pain, paresthesias, or numbness in the sensory distribution of the median nerve in the hand. The median nerve supplies sensation to the most important portion of the hand—the lateral half of the palm, the lateral half of the ring finger, and the volar aspect of the entire middle finger, index finger, and thumb. The median nerve also innervates the opponens, short flexor, and short abductor muscles of the thumb. Pressure on the median nerve in the carpal tunnel may be sufficiently great to produce paralysis of these thenar muscles.

It is readily understood how trauma to the wrist involving the distal end of the radius and the carpal bones may so alter the contour of the carpal tunnel that the median nerve may become compressed be-

From the Department of Orthopedic Surgery, the Cleveland Clinic Foundation, and the Frank E. Bunts Educational Institute.

Read before the Section on Orthopedic Surgery at the 105th Annual Meeting of the American Medical Association, Chicago, June 12, 1956.

neath the transverse carpal ligament. In certain pathological conditions, notably acromegaly and pleonosteosis, there may be sufficient hypertrophy of the bones as well as thickening of connective tissue and ligamentous structures to produce compression of the median nerve in the carpal tunnel. We are concerned, however, in this report with a spontaneous gradual compression neuropathy of the median nerve, without any evidence or history of injury or disease. We believe this condition in most instances results from a chronic, nonspecific synovitis involving the flexor synovialis in the carpal tunnel.

The term carpal tunnel syndrome is now used to describe all cases of compression neuropathy of the median nerve in the carpal tunnel. It is only in the past few years that this syndrome has been brought to the attention of the medical profession. Since the presentation of our first three cases at a meeting of the American Society for Surgery of the Hand in January, 1949, there have been numerous other reports in the literature.[1] Our attention was drawn to this condition by the report of Brain, Wright, and Wilkinson [2] in 1947; they described six patients in whom the condition had been successfully treated by section of the transverse carpal ligament. This operation was recommended by Marie and Foix [3] in 1913, by Moersch [4] in 1938, and by Cannon and Love [5] in 1946. In three of the 38 cases of "tardy median palsy" reported by Cannon and Love, there was no associated injury or disease, and these cases, therefore, might be classified as spontaneous median neuropathy.

Material

The purpose of this paper is to report our findings in 71 patients having spontaneous compression neuropathy of the median nerve in the carpal tunnel who have been examined here during the past eight years. Of these 71 patients, 54 (76%) were women and 17 (24%) were men. Originally, we believed this condition existed almost exclusively in women.

Of the 71 patients, the youngest was 24 years of age and the oldest 77 years. A little more than 60% of the patients were between the ages of 40 and 60 years.

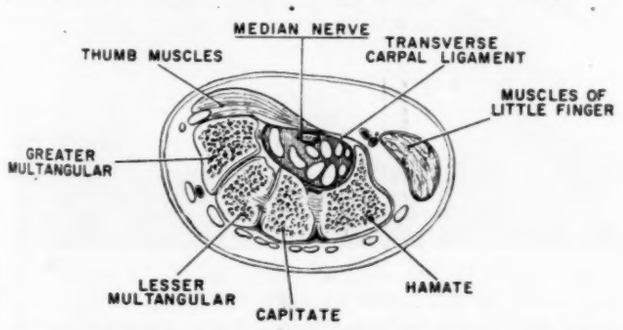


Fig. 1.—Diagram of cross section of wrist through carpal tunnel. Median nerve lies immediately beneath transverse carpal ligament and on top of all flexor tendons.

Three of the patients were from 0 through 30, 11 from 31 through 40, 23 from 41 through 50, 20 from 51 through 60, 10 from 61 through 70, and 4 from 71 through 80 years of age.

Of the 71 patients, 39 had symptoms in both hands and 32 had symptoms in only one hand. A few of the patients who initially had symptoms in one hand subsequently developed symptoms in the other hand. Of the 32 patients with unilateral symptoms, 9 patients' symptoms were in the left hand, and only 1 of these 9 patients was left-handed. In almost every instance of bilateral involvement, the patient's symptoms were worse in the dominant hand; this would indicate that active use of the hand tends to aggravate the condition.

Fig. 2 (case 1).—*Top*, anterior view and, *bottom*, lateral view of hands, showing pronounced atrophy of thenar muscles in left hand. This is much more apparent when thenar eminence is observed in profile.

Report of Cases

The following case reports illustrate the diagnosis and clinical course in typical examples of spontaneous compression neuropathy of the median nerve in the carpal tunnel.

Case 1.—A 49-year-old woman was first examined at the Cleveland Clinic on July 6, 1954. She complained that her left thumb had become progressively weaker and more useless during the past six months and that atrophy of the thenar muscles had increased during the past three months. There was no pain in the hand or wrist. The patient's mother, aged 74 years, had a similar condition in both wrists, with extreme atrophy and weakness in both thumbs.

Physical examination revealed slight hypesthesia in the median distribution of the left hand, involving chiefly the thumb and index finger. There was pronounced atrophy of the thenar muscles and weakness of pinch between the thumb and fingers (fig. 2). Tinel's sign over the median nerve at the wrist was absent. The wrist flexion test (complete flexion of the wrists, sustained for 60 seconds) produced numbness and tingling in the median distribution of the left hand only. There was no swelling and no restriction of motion in any joint.

On July 20, 1954, the transverse carpal ligament in the left hand was sectioned through a 3-cm. transverse incision in the distal flexion crease of the wrist. No definite compression of the median nerve was noted at the time of the operation, but the flexor synovialis in the carpal tunnel was moderately thickened. Biopsy of this thickened synovialis and of the transverse carpal ligament revealed no evidence of inflammation.

Fifteen days postoperatively, the patient no longer had hypesthesia in her left hand. Five months later she had more strength in her hand, and there was less atrophy of the thenar muscles. A little more than one year postoperatively, atrophy of the thenar muscles had disappeared and there was a complete return of normal strength in the left thumb. It is now almost two years since this patient's operation, and she has had no further trouble with her hand.

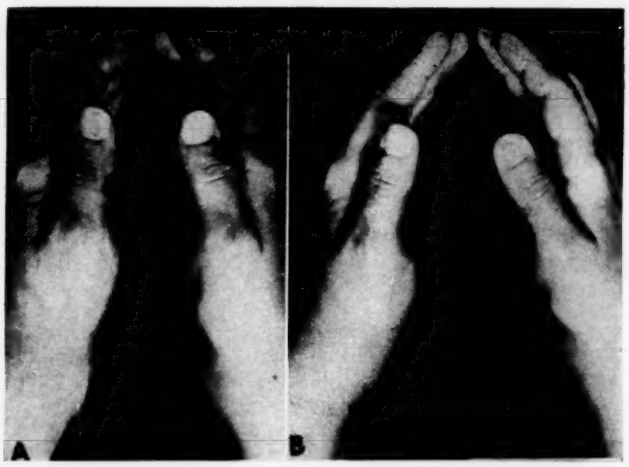


Fig. 3 (case 2).—*A*, lateral view of hands, showing bilateral atrophy of thenar muscles, more pronounced in right hand. *B*, lateral view of both hands three months after decompression of median nerve at left wrist, showing return to normal of thenar muscles in left hand.

Case 2.—A 38-year-old woman was first examined here on July 6, 1954. She had noticed slight pain in the thumb and index and middle fingers of her right hand about 10 years previously. There was no history of injury. Three years before examination, she developed numbness in the median distribution of her right hand, together with a slight flexion deformity of all fingers. She consulted a neurosurgeon who made a diagnosis of compression neuropathy of the median nerve in the carpal tunnel. In September, 1951, the right wrist was operated on, with section of the transverse carpal ligament and neurolysis of the median nerve. The flexion contracture of the fingers and some of the pain in her hand were relieved after this operation, but the numbness continued to increase in severity, and she still had much pain in her hand at night. During the year before examination here there had been a gradual atrophy of the thenar muscles. In March, 1954, four months before examination, she first noticed pain and numbness in the median distribution of the left hand. These symptoms had gradually increased in severity so that she had great difficulty in buttoning her clothes or doing any sort of work with her hands. During the two months before examination, she had observed a gradual wasting of the thenar muscles, accompanied by extreme weakness in her thumb. She frequently had cut and burned her fingers without realizing it. She had noticed a slight swelling on the volar aspect of each wrist for the past several months.

Examination of the right hand revealed extreme hypesthesia in the median distribution, with pronounced atrophy of all the thenar muscles supplied by the median nerve. Grip in the hand was weak. The wrist flexion test was negative, and Tinel's sign was weakly present over the median nerve at the wrist. There was a soft, nontender, subcutaneous swelling over the flexor tendons just proximal to the wrist joint. There was a well-healed longitudinal operative scar, 4.5 cm. in length, extending across the wrist joint and volar aspect of the forearm. Results of examination of the left hand were essentially the same as those in the right except that the hypesthesia in the median distribution and the thenar atrophy were not quite as pronounced (fig. 3*A*).

On Aug. 7, 1954, the left wrist was operated upon. The flexor synovialis was found to be greatly hypertrophic and densely adherent to the flexor tendons. There was a bulbous swelling of the median nerve proximal to the edge of the transverse carpal ligament, and the nerve was severely compressed within the carpal tunnel. The transverse carpal ligament was sectioned, and the major portion of the thickened flexor synovialis was excised. The median nerve was adequately decompressed by this procedure. Ten days postoperatively, the patient noticed some return of sensation in the median distribution of her hand. She no longer had any pain in her hand. Eleven weeks postoperatively, she lacked sensation only in the tips of the index and middle fingers and the thenar muscle atrophy was disappearing.

The patient requested that another operation be performed on her right wrist. On Dec. 9, 1954, a 7-cm. incision was made transversely across the wrist for a short distance and then continued down the center of the forearm, excising the previous incisional scar. The palmaris longus tendon was found to be pressing firmly down into the substance of the median nerve; this tendon was excised. The median nerve was found to be flattened and moderately indurated. The normal median nerve at a point 6 cm. from the distal flexor crease at the wrist measured 6 mm. in diameter. The nerve then ballooned out to 12 mm. in diameter as it passed into the carpal tunnel (fig. 4). The nerve was also compressed in the carpal tunnel. The flexor synovialis was thickened and had to be separated by sharp dissection from the flexor tendons. It was necessary to excise the major portion of this flexor synovialis to decompress the median nerve. Three weeks after the second operation, the patient noticed slight improvement in sensation in her right hand, and she also experienced some twitching in the paralyzed thumb muscles. Six months later, there was further return of sensation in the hand but no evidence of improvement in the thenar atrophy.

At the present time, the patient has normal sensation in her left hand and normal power in the thumb muscles. Sensation is diminished in the tips of the thumb and index and middle fingers of the right hand, and there still is moderate atrophy of the thenar muscles (fig. 3*B*). Biopsy specimens of the flexor synovialis from each wrist revealed a microscopic picture compatible with rheumatoid synovitis. The synovial lining cells were hypertrophic, and there were focal collections of lymphocytes (fig. 5).

Case 3.—A 55-year-old man was first examined here on Nov. 30, 1954. For three years prior to examination the patient had recurrent attacks of severe pain and tingling in the median distribution of his right hand. There was no history of any injury to the wrist, but each attack seemed to follow excessive use of his hand. In the past year he had observed some wasting away of the thenar muscles and had noticed that the paresthesias in his hand became more severe when he was writing. Between the acute attacks there remained some hypesthesia in the median distribution in the hand.

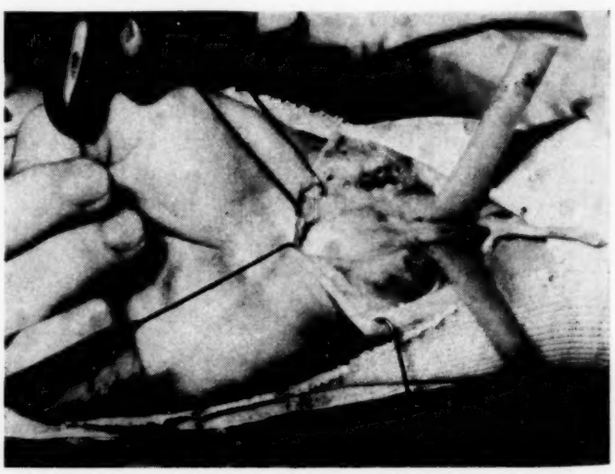


Fig. 4 (case 2).—Photograph showing findings at operation on right wrist. Palmaris longus tendon has been sectioned at its insertion and turned backward onto forearm. Rubber drain has been passed beneath normal median nerve in forearm. Note how median nerve is swollen proximal to transverse carpal ligament due to pronounced hypertrophy of underlying flexor synovialis.

Examination revealed that Tinel's sign over the median nerve at the wrist was present, a positive wrist flexion test, mild hypesthesia in the median distribution distal to the wrist joint, and moderate thenar atrophy, involving principally the short flexor and short abductor muscles. A roentgenogram of the wrist revealed no abnormality.

On Dec. 30, 1954, the transverse carpal ligament was sectioned through a transverse incision in the distal flexion crease at the wrist. There was a definite bulbous swelling of the nerve proximal to the edge of the transverse carpal ligament. The palmaris longus tendon was excised because it appeared to have been exerting considerable pressure on the underlying median nerve. The flexor synovialis was moderately thickened. A biopsy of this synovialis revealed evidence of chronic nonspecific inflammation.

The day after operation, the patient said that he no longer had the "thorns in the end of the fingers" that he had had prior to the operation, especially at night. When the patient was last seen in May, 1956, he had no symptoms referable to either hand and the thenar atrophy had disappeared.

Diagnosis

The diagnosis of spontaneous compression of the median nerve in the carpal tunnel must be considered when a patient complains of hypesthesia or paresthesias in the median distribution or when there is isolated paralysis of the thenar muscles supplied by the median nerve. The history is usually that of a progressive weakness and clumsiness in the hands, associated with numbness and tingling in the median distribution distal to the wrist joint. Although occasionally there may be some aching or pain radiating up the forearm and even up to the shoulder, there never are any objective sensory changes proximal to the wrist joint.

In none of the 71 patients in this series was there a history of injury. We have seen two cases in which the carpal tunnel syndrome developed many years after fractures about the wrist; these cases of tardy median palsy are not included in this series.

In patients with bilateral compression neuropathy, the symptoms were more severe in the dominant hand. Strenuous use of the hand always seemed to aggravate the pain and numbness in the median distribution, although the patient sometimes was not aware of this until after resting the hand for several hours after the manual activity. Many patients also complained of pain at night, which frequently was severe enough to prevent sleep. Although the hypesthesia was slight in some cases at the time of testing, the patient would readily point out the portion of the hand in which paresthesias and numbness occurred after strenuous use of the hand; and this area invariably coincided with the sensory distribution of the median nerve.

Hypesthesia in the median distribution was the most constant of all clinical findings in this series, occurring in 68 (96%) of the 71 patients. Tinel's sign is a tingling sensation radiating out into the hand, obtained by light percussion over the median nerve at the wrist. Tinel's sign was present in 63 (89%) of the 71 patients.

Atrophy of the thenar muscles—opponens, short flexor, and short abductor muscles—was observed in varying degrees in 38 (54%) of the 71 patients. Some of these patients were unaware of this atrophy until it was brought to their attention. On looking down on the palm of the hand, one may often fail to observe the thenar atrophy, which is readily apparent when the profiles of the two thumbs are compared (fig. 2). If the opponens muscle is spared, there may be pronounced atrophy of the thenar muscles without significant weakness in the thumb. It has been established that there may be marked anatomic variation in the innervation of the thenar muscles; the ulnar nerve may supply some or all of the thenar muscles that usually are supplied by the median nerve.[6]

The so-called wrist flexion test was a very helpful diagnostic aid. The patient is asked to flex both wrists completely and keep them flexed for approximately 60 seconds. In this position, the median nerve is pressed upon by the proximal edge of the transverse carpal ligament to a greater extent than it is when the wrist is extended. Even in the normal wrist, prolonged complete flexion of the wrist will eventually cause numbness in the median distribution in the hand. In cases of compression neuropathy of the median nerve, however, there usually is a prompt exacerbation of numbness and paresthesias in the median distribution in the hand when the wrist is held in a flexed position, with prompt improvement in these symptoms when the wrist is returned to a neutral position. The wrist flexion test was positive in 57 (73%) of the 71 patients.

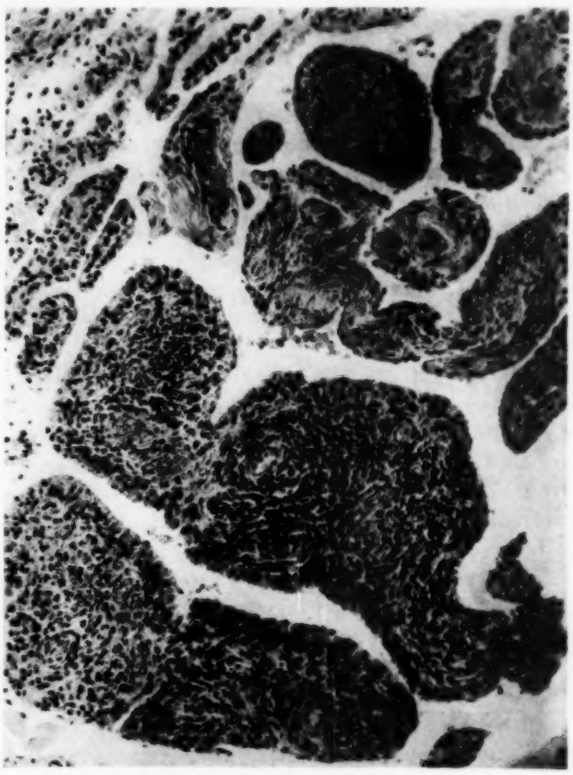


Fig. 5 (case 2).—Photomicrograph of flexor synovialis showing hypertrophy of synovial lining cells and focal collections of lymphocytes compatible with microscopic findings in rheumatoid synovitis.

It has been shown experimentally that pressure within the carpal tunnel is increased by extension of the wrist. Sustained extension of the wrist, therefore, may also produce an exacerbation of numbness and tingling in the median distribution. However, we have found that the wrist extension test is only occasionally positive in these cases and is not a reliable diagnostic sign.

A pneumatic-tourniquet test has been described by Gilliatt and Wilson.[7] Increased pain and paresthesias in the median distribution is produced by inflating a pneumatic cuff above the systolic pressure on the arm of patients with a carpal tunnel syndrome. The test was positive in 13 of a series of 35 patients with compression neuropathy of the median nerve. In many of our more recent cases we have employed this test, but we believe it is not so reliable as the wrist flexion test.

Roentgenograms were made of at least one wrist in each patient in this series. In no case was there evidence of sufficient arthritis or bony abnormality to produce the patient's symptoms of median nerve compression. Special carpal tunnel views were not made in every case, so we cannot comment specifically about the bony contour of the carpal tunnel. Since none of the patients in this series had a history of injury to the wrist or hand, one would not anticipate the presence of structural abnormalities in the distal radius or the carpus.

If there is sufficient thickening of the flexor synovialis, there may be obvious swelling or a palpable thickening over the volar aspect of the forearm proximal to the wrist joint. On two occasions, the median nerve itself was palpable as a firm, very tender subcutaneous mass immediately proximal to the transverse carpal ligament. This mass was mistaken for a ganglion preoperatively in one case; this case has been previously reported by one of us.[8]

In the 71 patients, the duration of symptoms referable to the hands was less than 6 months in 17 patients, from 6 months to 2 years in 23, from 2 years to 10 years in 19, from 10 years to 15 years in 8, from 15 years to 25 years in 3, and more than 25 years in 1. It is interesting to note that only 17 (24%) of the patients had had symptoms in their hands for six months or less. The great majority of the patients had had complaints referable to their hands for at least a year or more. Two patients had had symptoms for 20 years, one for 25 years, and another for 30 years.

Differential Diagnosis

Pain and hypesthesia in the fingers can be produced by any lesion involving the nerve pathways to the hand. Lesions of the central nervous system, such as brain tumors, syringomyelia, or degenerative diseases of the spinal cord, sometimes are causative. Much more frequently, however, the lesion is found to be one that produces irritation of the fifth to eighth cervical nerve roots, such as protruded cervical intervertebral disks, hypertrophic arthritis of the cervical spine, and injuries involving the cervical nerve roots. The peripheral nerves, including the brachial plexus, may be the site of the trouble. A tumor or aneurysm in the neck, a cervical rib, or a tight anterior scalene muscle may compress the trunks of the brachial plexus. The symptoms in the hands may be only a part of a generalized polyneuritis or a diabetic neuropathy.

All of these conditions must be considered in the differential diagnosis of the carpal tunnel syndrome. An accurate diagnosis of compression neuropathy of the median nerve in the carpal tunnel may be made, however, if Tinel's sign is present over the median nerve at the wrist, a wrist flexion test is positive, and all objective sensory findings are strictly limited to the median distribution distal to the wrist. These are the three most reliable and most constant findings, and in almost every case at least two of these three clinical findings are present. In addition, there will be partial atrophy of the thenar muscles in more than half of the cases.

Pathogenesis

From our experience in the observation and treatment of these 71 patients, we have concluded that spontaneous compression of the median nerve in the carpal tunnel is caused by thickening of the flexor synovialis within the carpal tunnel. The exact etiology of this condition could not be determined. Biopsy specimens of the flexor synovialis were taken from 38 of the 49 wrists operated upon; and 14 of these biopsies showed evidence of a chronic inflammation compatible with a diagnosis of rheumatoid synovitis. The other 24 biopsies revealed only a fibrosis or thickening of the synovialis without definite evidence of any inflammatory changes. Sections were also made of the transverse carpal ligament in some of the patients, but no evidence of inflammation was seen in any of these specimens.

Edema and thickening of the flexor synovialis seem to us to be the most likely cause of the development of a spontaneous compression of the median nerve in the carpal tunnel. Nissen[14] has also found a chronic nonspecific proliferative tenosynovitis about the flexor tendons in his cases. We believe this tenosynovitis must be fundamentally rheumatic in origin, although it is certainly not necessarily associated with true rheumatoid arthritis. The improvement noted in some cases after the injection of hydrocortisone (Hydrocortone) into the carpal tunnel would also lend credence to the rheumatic nature of the tenosynovitis. Furthermore, many of the patients complained of some periarticular swelling and transient stiffness in the small joints of the hand; these symptoms were believed to result from a periarthritis.

Ischemia of the median nerve has been cited as the primary cause of this spontaneous compression neuropathy.[1c] Certainly, compression of the nerve may result in a certain degree of ischemia, and this ischemia may, in turn, play some role in the production of the clinical syndrome. The rapid disappearance of paresthesias and pain after operation makes it reasonable to regard the lesion as a transient ischemia of the nerve, but we believe this ischemia must be secondary to the thickening of the flexor synovialis rather than a primary condition.

We believe that spontaneous compression neuropathy of the median nerve in the carpal tunnel is not an occupational disease. Often repeated, forceful grasping movements might cause some tenosynovitis of the flexor tendons in the carpal tunnel, but this certainly is not a common finding. External pressure, of course, from a hard object over a long period of time might also cause some direct pressure on the median nerve. Kendall[1e] believes that the principal factor in the production of the carpal tunnel syndrome is a compression of the median nerve by muscle ac-

tion. It is true that almost every patient in our series described an aggravation of symptoms after strenuous use of the hands, and the symptoms were almost always worse in the dominant hand. None of these patients, however, consistently did an excessive amount of work with the hands.

The carpal tunnel syndrome has been described in association with certain systemic disorders, such as acromegaly and pleonosteosis,[9] which are usually accompanied by various degrees of proliferation of fibrous tissue. There was no evidence of these systemic disorders in any of our cases.

It is interesting to speculate why spontaneous compression of the median nerve occurs so much more frequently in women than in men. There is no structural difference in the carpal tunnels of men and of women. Men certainly subject their hands to more trauma than do women. It is a well-known clinical observation, however, that rheumatic conditions of various types about the wrist and hand are more common in women than in men. In this present series of cases, there was one woman with an associated Quervain's disease (stenosing tenosynovitis of the long abductor and short extensor tendons of the thumb), four women had an associated "trigger finger" (stenosing tenosynovitis of the flexor tendons in the palm), one woman had an acute pisiform bursitis, and two women had a "tennis elbow" (lateral humeral epicondylitis).

Since the majority of patients with compression neuropathy of the median nerve are women in menopause, Schiller and Kolb[9b] have suggested that there may be a stimulation of connective tissue growth when estrogens are no longer present to suppress the activity of pituitary growth hormone. They have treated three patients with so-called menopausal median neuropathy by the administration of estrogens; in each patient the digital pain disappeared. We have not used this treatment in any of our cases, but other authors[1c] state that treatment with estrogens is not effective.

Treatment

Decompression of the median nerve may be readily accomplished by section of the transverse carpal ligament. This operation is recommended only when the patient's symptoms are severe and of long duration or when there is evidence of progression of the numbness and paresthesias in the fingers or evidence of thenar atrophy.

The operation can be readily performed with the aid of local anesthesia, but we prefer to employ a general anesthetic, which permits a more thorough exploration of the median nerve and carpal tunnel. A bloodless field, obtained by use of a pneumatic tourniquet, greatly facilitates the operation.

A 3-cm. transverse incision is made in the distal flexion crease of the wrist. The medial end of this incision may be continued up the forearm, and the lateral end of the incision may be continued into the palm, forming an S-shaped incision through which the entire carpal tunnel and the lower forearm may be exposed. We have seldom found it necessary, however, to employ so long an incision. The simple transverse incision usually provides sufficient exposure to permit section of the transverse carpal ligament. Care must be taken to section the entire ligament along its medial aspect in order to avoid any possible damage to the recurrent branch of the median nerve.

A simple sectioning of the tranverse carpal ligament is usually sufficient to decompress the median nerve. However, it sometimes is necessary to do a partial synovectomy before adequate decompression of the nerve can be obtained. Synovectomy was done in 3 of the 49 procedures in this series.

Since there has been no evidence of any disability whatsoever from section of the transverse carpal ligament, no patient should be denied the benefit of operation if there are positive indications for surgical treatment as noted above. Not all patients with spontaneous compression of the median nerve in the carpal tunnel require surgery. If the symptoms are mild and of short duration, a period of rest for the hand, with use of a simple wrist splint, may cause all symptoms to disappear. The administration of hydrocortisone also may result in improvement.

In this series we have operated upon 49 wrists in 37 patients. Twelve patients with bilateral symptoms had only one wrist operated upon. Eleven other patients with bilateral symptoms had only one wrist operated upon, symptoms in the other hand not being sufficiently severe to require surgical treatment. We preferred not to operate upon both wrists at the same time; only two patients insisted that this be done. One wrist was operated upon twice because the transverse carpal ligament was not completely severed at the first operation.

Results of Treatment

The results in all 49 wrists that were surgically treated were good as far as relief from pain was concerned. Not infrequently, on the day after the operation, the patients would volunteer the information that they no longer had the paresthesias and night pain that they used to have. Normal sensation returned in 32 hands, and the remaining 17 hands regained some sensation in varying degrees.

Thirty of the hands that were operated on had evidence of thenar atrophy. Thirteen of these hands regained normal size and strength in their thenar muscles within from 6 to 12 months after the operation. Eight of the 30 hands showed no evidence of regeneration of the thenar muscles, but none of these became worse. The remaining nine hands showed varying degrees of improvement. The thenar muscles improved the quickest, of course, in those hands in which the muscles had been paralyzed the shortest time preoperatively. As a general rule, if the paralysis had existed for more than one year, the outlook for recovery after decompression of the median nerve was not too good. However, two patients who had had atrophy for more than three years regained normal thenar muscles after the operation.

Fifty per cent of the wrists that were operated upon showed a definite bulbous swelling of the median nerve proximal to the edge of the transverse carpal

ligament. In no case was there evidence of a true interstitial neuroma. It was not necessary to perform a neurolysis of the median nerve in any case.

At operation the median nerve showed evidence of obvious compression by the transverse carpal ligament in 60% of the cases. In some there was a definite groove in the nerve where it rested beneath the proximal edge of the transverse carpal ligament. We realize that there is normally a certain degree of flattening of the median nerve as it passes through the carpal tunnel.

At operation 70% of the wrists showed definite evidence of a thickening of the flexor synovialis that we believe was sufficient to account for the median nerve compression.

Five cases were reported as showing no obvious abnormality at the time of operation. However, all of these patients were promptly relieved of their symptoms after sectioning of the transverse carpal ligament.

In 20 of our more recent cases we have employed injections of hydrocortisone into the carpal tunnel, and 16 of these patients have shown definite improvement. Usually three or four injections of 1 cc. at weekly intervals are sufficient, and several patients required only a single injection for relief. The injection is made by inserting a 25-gauge needle directly into the carpal tunnel, passing just medial to the palmaris longus tendon and the median nerve. The 1 cc. of hydrocortisone is dispersed among the flexor tendons and beneath the median nerve in the carpal tunnel. No discomfort is experienced by the patient during the injection.

Summary

We examined 71 patients with spontaneous compression of the median nerve in the carpal tunnel. Most of these patients were women between the ages of 40 and 60 years. We believe that in most, if not all, of these cases the condition was caused by some type of localized rheumatic disease—most often a chronic nonspecific proliferative tenosynovitis of the flexor tendons. Diagnosis of this condition is made on the basis of a positive wrist flexion test, the presence of Tinel's sign over the median nerve at the wrist, and the limitation of all sensory findings to the median distribution distal to the wrist. The majority of the patients in this series also had evidence of partial thenar atrophy. The patient's symptoms of pain and paresthesias in the median distribution of the hand may be readily relieved by sectioning the transverse carpal ligament to decompress the median nerve in the carpal tunnel. Only rarely is a partial synovectomy also necessary to decompress the nerve adequately. In some cases surgery is not necessary; a simple wrist splint or the administration of hydrocortisone may alleviate the symptoms.

2020 E. 93rd St. (6) (Dr. Phalen).

References

1. (*a*) Phalen, G. S.; Gardner, W. J.; and LaLonde, A. A.: Neuropathy of Median Nerve Due to Compression Beneath Transverse Carpal Ligament, J. Bone & Joint Surg. **32-A:**109-112 (Jan.) 1950. (*b*) Lang, E. F., Jr.: Syndrome of Median Nerve Compression in Carpal Tunnel, S. Clin. North America **34:**853-857 (June) 1954. (*c*) Kremer, M.; Gilliatt, R. W.; Golding, J. S. R.; and Wilson, T. G.: Acroparæsthesiae in Carpal-Tunnel Syndrome, Lancet **2:**590-595 (Sept.) 1953. (*d*) Nissen, K. I.: Etiology of Carpal Compression of Median Nerve, J. Bone & Joint Surg. **34-B:**514-515 (Aug.) 1952. (*e*) Kendall, D.: Non-penetrating Injuries of Median Nerve at Wrist, Brain **73:**84-94 (March) 1950.

2. Brain, W. R.; Wright, A. D.; and Wilkinson, M.: Spontaneous Compression of Both Median Nerves in Carpal Tunnel: Six Cases Treated Surgically, Lancet **1:**277-282 (March 8) 1947.

3. Marie, P., and Foix, C.: Atrophie isolee de l'éminence thénar d'origine nevritique: Rôle du ligament annulaire antérieur du carpe dans la pathogénie de la lésion, Rev. neurol. **26:**647-649, 1913.

4. Moersch, F. P.: Median Thenar Neuritis, Proc. Staff Meet. Mayo Clin. **13:**220-222 (April 6) 1938.

5. Cannon, B. W., and Love, J. G.: Tardy Median Palsy; Median Neuritis; Median Thenar Neuritis Amenable to Surgery, Surgery **20:**210-216 (Aug.) 1946.

6. Rowntree, T.: Anomalous Innervation of Hand Muscles, J. Bone & Joint Surg. **31-B:**505-510 (Nov.) 1949.

7. Gilliatt, R. W., and Wilson, T. G.: Pneumatic-Tourniquet Test in Carpal Tunnel Syndrome, Lancet **2:**595-597 (Sept.) 1953.

8. Phalen, G. S.: Spontaneous Compression of Median Nerve at Wrist, J. A. M. A. **145:**1128-1132 (April 14) 1951.

9. (*a*) Watson-Jones, R.: Leri's Pleonosteosis, Carpal Tunnel Compression of Median Nerves and Morton's Metatarsalgia, J. Bone & Joint Surg. **31-B:**560-571 (Nov.) 1949. (*b*) Schiller, F., and Kolb, F. O.: Carpal Tunnel Syndrome in Acromegaly, Neurology **4:**271-282 (April) 1954.

Periodic Peritonitis.—American pediatric literature and textbooks do not contain any reports of periodic peritonitis, a syndrome which is familiar to internists in this country as well as physicians in the Near East and North Africa. This disease, often familial, apparently is limited principally to Arabs, Armenians, and Jews, but other peoples occasionally are affected. Periodic peritonitis is characterized by abdominal pain and tenderness, fever, polymorphonuclear leucocytosis, and, at times, pain in the thorax and joints. The duration of an attack is 24 to 72 hours; it is followed by complete remission, but exacerbations occur at regular intervals . . . and the remissions may become shorter with age. Most of the patients have undergone appendectomy in childhood. There is no appreciable effect on the general health or growth or development of afflicted children. In more than half of the reported cases the onset took place in childhood, and the condition has been reported in the United States, Lebanon, and North Africa. . . . The cause of this syndrome is unknown. Other authors have not found a relationship to allergy. No infectious agent has been implicated. The possibility of a neurologic background has been explored. However, patients with abdominal epilepsy do not have abdominal physical signs or fever, and their attacks usually are controlled by anticonvulsant medication.—G. S. Sturtz, M.D., and E. C. Burke, M.D., Periodic Peritonitis, *A. M. A. Journal of Diseases of Children*, October, 1956.

HEALTH HAZARDS ENCOUNTERED IN REPAIR OF JET AIRCRAFT FUEL CELLS

1st Lieut. Americo R. Lombardi (MSC)
and
Capt. Arthur S. Lurie (MC), U. S. A. F.

• *In the maintenance of jet aircraft, the most hazardous physical danger results from exposure to the jet fuels while maintenance personnel are repairing or replacing the rubber-lined fuel containers. The hazards involved include fire and explosion, acute intoxication from fuel vapors, systemic poisoning from tetraethyl lead, dermatitis from direct contact with petroleum hydrocarbons, and the acute psychological factor of confinement. In a study of 12 men who carry out fuel cell repair, occasional central nervous system reactions occurred among those who did not wear masks while performing their duties. The type and cause of the reactions point out the safety measures to be taken.*

The health problems encountered by Air Force personnel engaged in the maintenance of jet bombers could, in the not-too-distant future, be encountered by personnel performing a similar operation on commercial jet airliners. Undoubtedly, the most hazardous of these operations is the cleaning and repair of the aircraft fuel cells, an operation potentially more hazardous than the cleaning of bulk gasoline storage tanks.

A study of this operation has been performed at Smoky Hill Air Force Base, Salina, Kan., with two principal objectives: (1) to evaluate the physical dangers that could result from chronic or acute exposure to aviation gasoline and/or jet fuels, and (2) to review the medical and engineering precautions necessary for the safety of the personnel engaged in this operation.

The fuel cells of the B-47 jet bomber are rubber-lined cubicles that fill cavities within the aircraft fusilage. Trained personnel must enter these cells to effect repairs or to remove the rubber lining entirely if necessary (see figure). Entrance into these cells is gained by means of small portals located on the undersurface of the fusilage and in the bomb bay. The interior of the cell provides minimal space for freedom of movement by personnel performing the operation of repair or removal. Since most of the cells are interconnected, it is often necessary to crawl from one cell into another, thus penetrating deeper into the fusilage of the aircraft and away from sources of ventilation (see figure, *B*).

It can, therefore, be readily seen that the operation is performed under extremely poor working conditions. The limited size of the access opening and the limited working space prohibit the use of cumbersome protective equipment by personnel. In addition, the very close confinement of the personnel while they are thus engaged is an acute psychological factor. Additional hazards include fire and explosion, acute intoxication from fuel vapors, systemic poisoning from tetraethyl lead, and dermatitis from direct contact with petroleum hydrocarbons.

Toxicity and Chemical Nature of Jet Engine Fuel

The figure 1,000 ppm is that most widely quoted as being the "safe limit" for prolonged exposure, while the safe-practice manuals state that "atmosphere within a tank which registers more than 14 to 20 per cent of the lower combustible limit is considered unsafe for breathing even for a short period of time."[1] In the performance of fuel cell repair or removal, it has been found impractical to use these limits as a safe criterion because of the rapid build-up of toxic vapors even after ventilation for long periods of time. This is due to the interconnection of the fuel cells, which allows the fuel vapors to travel freely from one cell to another, and to the limited number and size of the access openings through which the cells can be ventilated. In addition, evidence that these limits are dangerously high has been presented along with the contention that a single figure for maximum permissible concentration of solvent vapors for a number of materials such as gasoline, jet fuel, benzine, and petroleum naphtha is not practical because of the wide variation in their chemical composition.[2]

Toxicologically, the Air Force has taken the stand that jet fuel and aviation gasoline are very similar, with the noticeable exception that jet fuels do not contain tetraethyl lead.[3] However, most jet engines can and do burn aviation gasoline occasionally, producing a potential lead exposure hazard to the men engaged in the fuel cell repair work as well as to other maintenance and repair personnel.

The jet fuel presently used by the United States Air Force exists in three grades, JP-1, JP-3, and JP-4, with JP-4 the fuel in common usage at present. The chemical composition of jet fuels has general characteristics, and all three fuels utilized by the Air Force are toxicologically similar. Basically, jet fuels consist principally of aliphatic hydrocarbons, with JP-1 containing not more than 20% of aromatic hydrocarbons by volume, while JP-3 and JP-4 contain not more than 25% of aromatic hydrocarbons by volume. In addition, JP-3 and JP-4 may contain up to 0.4% by weight of sulfur compounds other than mercaptan sulfur and as much as 0.005% of mercaptan sulfur by weight. These fuels may also contain oxidation in-

Sanitary and Industrial Hygiene Engineer (Lieutenant Lombardi) and Chief, Preventive Medicine Section (Captain Lurie), 802nd Air Division, 4166th USAF Hospital, Strategic Air Command, Smoky Hill Air Force Base, Salina, Kan. Lieutenant Lombardi is now at the USAF Hospital, Schilling Air Force Base, Salina, Kan. Captain Lurie is now at the New England Center Hospital, Boston.

hibitors such as amines or phenols in small amounts.

That jet fuel is toxic in the same order of magnitude as aviation gasoline is substantiated by the approximately equal percentage of aromatics present in each fuel.[4] However, jet fuel is slightly less volatile due to a higher distillation temperature range, which reduces the likelihood of equally high concentrations occurring under similar conditions of temperature and pressure.[5] To the man working within the fuel cells, however, the resultant advantage that can be realized by this factor is almost nil.

Paddy[6] states that "evidence of serious systemic injury from the prolonged inhalation of low concentrations of aviation fuel vapors is scanty and inconclusive. It seems probable that concentrations low enough to produce no immediate response in susceptible persons will, upon long-repeated exposures, cause no serious chronic illness in man, but this point has yet to be established."

Dermatitis due to petroleum derivatives can be classified as contact or exogenous in nature. It is most often an eczematous, follicular, or acneiform eruption. Petroleum derivatives are fat solvents, which remove the natural skin oils and cause dermatitis by their defatting properties. In addition, the chemicals present in fuels as inhibitors are also likely contributors to dermatitis. Removal of the petroleum irritant from contact with the skin usually results in an improvement in the skin condition.

Toxic Reactions

The physical examinations performed on 12 airmen (average age, 23 years) who carry out fuel cell repair at this station were all within normal limits. All laboratory studies also were within normal limits. Because several men complained of dizziness, ataxia, and headaches during work and after leaving the cells, an attempt was made to discover if a relationship existed between the toxic symptoms and the wearing of a protective chemical cartridge mask (see table).

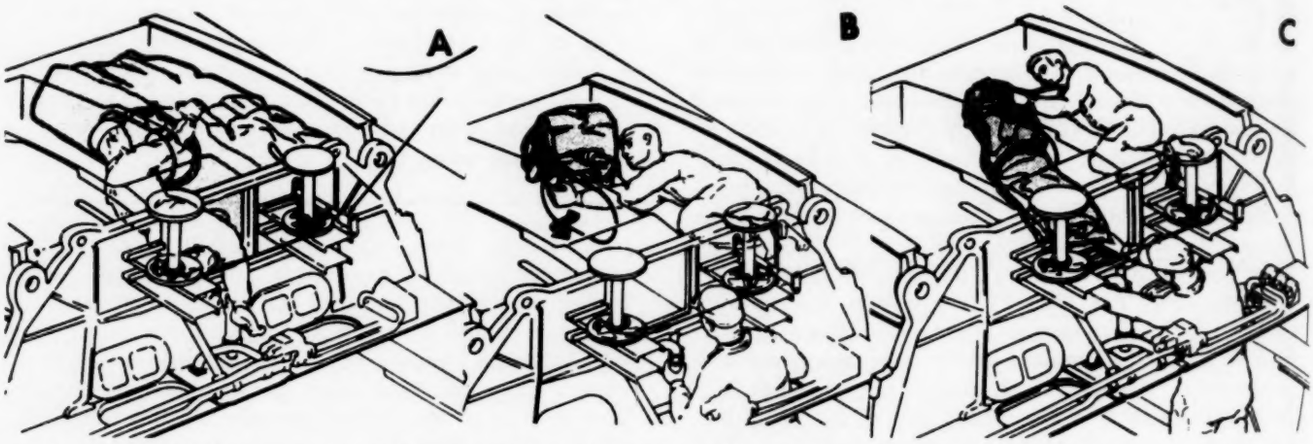
Occasionally there were central nervous system reactions; these occurred among those men who did not wear masks. None occurred among those who did wear masks. No definite evidence of chronic toxic effect was discovered in the 12 airmen examined. It is highly probable that chronologically older individuals would be more susceptible to permanent organic injury.

Safety Measures

Certain safety measures are recommended for personnel engaged in the cleaning and repair of jet aircraft fuel cells.

1. All personnel so engaged should have preemployment physical and laboratory examinations, with follow-up examinations at six-month intervals.

2. The fuel cells should be thoroughly emptied, dried, and ventilated prior to entry. The use of explosion-proof blowers equipped with multiple, long-length flexible ducts for easy insertion into the multiple cells is advocated for more positive ventilation. As the extreme confinement of the cell access openings makes it impossible for the men to wear positive-pressure hose masks, chemical cartridge-type face masks for organic vapors have been used at this station. As the efficiency of this type of mask is very limited (it is effective only at concentrations of organic vapors lower than 1,000 ppm), thorough evacuation of the fuel vapors from the cells must be accomplished before entry is made into the cells. Reventilation of the cells must be carried out whenever there is a re-



A, position of airman in one fuel cell about to deflate lining of second fuel cell for removal. B, position of airman in second cell cavity about to remove deflated fuel cell. C, removal of deflated fuel cell. Note location and size of access portals.

Relationship Between Reported Symptoms, Wearing of Protective Mask, and Total Time of Exposure in the Cells in Twelve Airmen

Examinee	Reported Symptoms	Wore Mask	Length of Exposure, Hr.
1	Ataxia and occasional "wobbly" sensation after leaving cells	No	320
2	None	No	1,200
3	Dyspepsia, indigestion	No	80
4	Dizziness (if remaining in cell too long)	No	720
5	Occasional sharp frontal headache and visual blurriness	No	400
6	None	No	480
7	None	Yes	1,360
8	None	Yes	560
9	"Echoing," repetition of thoughts, "racing of engines," fuel burns	Rarely	1,360
10	Skin becomes dry and peels when clothing becomes wet with fuel	Yes	1,632
11	None (experienced dizziness when masks were unavailable)	Yes	1,040
12	None	Yes	1,020

currence of fume accumulation in order to insure an adequate oxygen supply and to prevent fume intoxication. As the protection afforded by this type of mask is dubious even under these conditions, it is advocated that the positive-pressure type hose mask be adapted for use within fuel cells, thus insuring a constant supply of oxygen and positive protection against high concentrations of fuel and tetraethyl lead vapors.

3. The cleaning and repair of jet fuel cells should be performed by not less than two men, with one man outside the cell serving as the observer of the man within the cell. It is advisable that these two men carry on a continuous conversation (whenever possible), so that the observer may recognize an emergency and take prompt action in rescuing the repair operator.

4. Clean, light-colored clothing of a material that is not conducive to a build-up of static electricity should be worn by personnel entering the cells. This clothing should be changed and laundered upon the completion of a day's work or when it becomes contaminated with fuel.

5. Lightweight rubber gloves and shoe packs should be worn by the personnel working within the cells.

6. The workers should bathe at the end of each day's work or after any contamination of the body with fuel.

Summary

Twelve airmen were examined in order to review and evaluate the dangers that could result from acute and chronic exposure to aviation jet fuels. It was noted that occasional central nervous system reactions occurred among the men who did not wear a protective mask. All physical examinations and laboratory studies were within normal limits. The findings in the 12 men included in this study cannot be considered statistically significant on the basis of the evidence presented. Certain safety measures should always be followed by personnel engaged in this type of work.

USAF Hospital, Schilling Air Force Base, Salina, Kan. (Lieutenant Lombardi).

References

1. Accident Prevention Manual 1B, ed. 2, New York, American Petroleum Institute, Oct., 1950.
2. Paddy, F. A.: Industrial Hygiene and Toxicology, New York, Interscience Publishers, Inc., 1949, vol. 2, p. 743.
3. Health Hazards in Aviation Fuel Handling, Air Force pamphlet no. 160-6-2, Department of the Air Force, Department of Defense, Nov. 28, 1952.
4. Health Hazards from Propellant Fuels and Oxidizers, Air Force pamphlet no. 160-6-3, Department of the Air Force, Department of Defense, June 21, 1954.
5. Aviation Fuels and Their Effects on Engine Performance, New York, Ethyl Corporation, 1951.
6. Paddy,[2] p. 742.

LASTING VALUES IN MEDICAL EDUCATION

Herman G. Weiskotten, M.D., Skaneateles, N. Y.

• *There are many groups and agencies, including industry and the lay public, whose support and cooperation are essential to the continuous advancement of medical education and medical care. The teaching programs of our medical schools should not remain static. Important advances have been made, such as the shift of emphasis from the didactic to the experimental and practical methods of teaching, the establishment of full-time faculties, and the development of clinical clerkships. Criticisms that curriculums are overspecialized and that socioeconomic and environmental factors in sickness are neglected arise in large part from imperfect communication between groups; they indicate a need for the establishment of mutual understanding and cooperative relationship, especially between the schools and the local medical profession. Unilateral action has sometimes proved detrimental to all concerned. Continued progress depends on cooperation, especially on the part of leaders in both medical education and organized medicine.*

In this, my last address as Chairman of the Council on Medical Education and Hospitals of the American Medical Association, I had anticipated expressing my great satisfaction with the present continuing development of medical education and the enormous progress that has been made in recent years. I had anticipated congratulating the medical schools on this progress and on the recognition and support received, not only in this country but throughout the world.

However, as I have reviewed the various criticisms that recently have been directed toward our medical schools and their educational programs, I have been forced to the conclusion that many believe that all is not as well as I had thought. Some state that medical education is in a period of revolution; some, that it is in a period of transition; and others, that it is missing its objectives of training physicians for the care of patients. Still others state that it is training technical specialists rather than practitioners of medicine and, further, that there is an almost total neglect of the patient as a person and of a host of socioeconomic factors that frequently play a major role in the prevention, diagnosis, and treatment of disease.

Most of these indictments have come from individuals outside of the field of medical education who have special interests in socioeconomic, psychological, and public health fields as well as in the over-all problems that they consider involved in the complete medical care of the American public. In the main, however, these individuals have had no experience or

Chairman, Council on Medical Education and Hospitals of the American Medical Association.

Read before the 53rd Annual Congress on Medical Education and Licensure, Chicago, Feb. 11, 1957.

have no competence in the field of medical education. As a rule they have no first-hand information as to the details of the educational programs of the medical schools of the country. They look to the medical schools to solve the problems they visualize in these fields. Many of these individuals apparently are living in a world of words and phrases that they do not find listed in the curriculum outlines of the medical schools. They, therefore, conclude that nothing relating to these words and phrases is in any way touched upon in the undergraduate program.

Moreover, the activities of these groups and the support available from some of them have had an impact on many of the medical schools, inducing them to accept these indictments as justified. As an illustration of such impact, I quote a recent statement by the dean of one of our leading medical schools: "Our preoccupation with scientific medicine has tended to let the patient fade into a faceless, nebulous creature, often no more than a number on a test tube or an entry on a chart." Although I am sure that this grossly exaggerated criticism was intended to stimulate thoughtful study, it was understood by many to justify fully the previously mentioned indictments and to point out the need for revolutionizing medical education.

I do not wish to suggest in any way that the teaching programs of our medical schools should remain static. As in the past, so in the future, there will be need for changes in curriculum content and in methodology. These continually must be adjusted to changes in the scientific as well as in the clinical and social aspects of medicine. However, new material and new approaches should be adopted only after careful and intelligent study and experimentation by the faculties of our medical schools. The schools should never adopt changes merely as a result of unintelligent propaganda having its source from the outside, or as a result of pressures from the administration of the university, or even as a result of pressures from within the medical school itself.

In view of all these circumstances, I have decided to base this discussion on my personal observations and my review of the changes that have been and are now taking place in medical education. As one who has been intimately associated with medical education on a local and national basis for nearly half a century, I believe there is some justification for this effort.

The Flexner Survey

My interest in medical education began about the time of the Flexner survey. I well recall the visit of Drs. N. P. Colwell and Abraham Flexner to my school in October, 1909. At this time there had been developed laboratory exercises in the basic science courses in most of the better medical schools. However, these were, in general, "cook book" courses illustrating various demonstrable aspects of the material covered in the lectures and textbooks.

The course in anatomy was almost wholly limited to pure morphology and frequently involved the learning of rhymes to assist in the memorization of various anatomic structures. The main emphasis in the physiology laboratories was on muscle-nerve physiology. In bacteriology, most of the time was devoted to the making of culture mediums and to studying the cultural characteristics of bacteria. In pathology courses, students spent much time in staining and mounting sections that usually proved entirely unsatisfactory for microscopic study. I still remember how severely I was criticized in 1914 for the publication of a paper recommending the use of loan collections of well-prepared sections in order to provide time for using the experimental method in teaching pathology.

Teaching in the clinical years was almost entirely by lectures and by textbook assignments, with occasional medical and surgical amphitheater clinics and ward walks. Diagnosis was taught in a manner similar to that of the use of a set of football signals, with various groups of findings leading to the diagnosis of specific diseases. In practically all courses, efforts were made to cover completely a chosen textbook and, in general, emphasis was placed on the presentation of masses of often unrelated facts. Outpatient teaching largely involved practice in bandaging and in the prescribing of drugs for the symptomatic treatment of ambulatory patients.

Faculty meetings, when they were held, involved accusations and counteraccusations by preclinical and clinical teachers and involved demands by influential specialists for more and more hours for lectures and clinics. A relatively large percentage of graduates entered practice immediately after graduation from medical school.

Although a few medical schools are justified in considering the foregoing statements as an unwarranted indictment of their then-existing programs, I can assure you that these statements do represent a true picture of the general level of medical education at that time. A few schools, notably Johns Hopkins Medical School, had been developing programs based on sound educational and scientific principles. These schools, together with a group of competent and dedicated individuals serving as faculty members in other medical schools, were to serve as the "torchbearers" in the advancement of medical education.

The great impact of the Flexner report was such that medical schools were forced to give serious attention to the improvement of their educational programs. Proprietary medical schools soon disappeared, and medical education passed out of the hands of isolated groups and was turned over to the universities. There resulted an increased interest in the programs of the Association of American Medical Colleges and of the Council on Medical Education, which had assumed roles of accreditation. Attendance at the Annual Congress on Medical Education and at the meetings of the Association of American Medical Colleges increased markedly. The programs of these meetings dealt with the problems and new developments in the educational programs. Visits by representatives of the college association and the Council provided opportunity for the discussion of the programs of the individual schools.

Medical Science Developments

Advancements in the medical sciences emphasized the necessity of students receiving a thorough grounding in the basic medical sciences if they were to apply these in their clinical training and later practice.

Establishment of Full-time Faculty.—It became apparent that the character and training of the faculty, together with its interest in contributing to the advancement of medicine and its effective influence on students, more than any other factor, determined the quality of a medical school. The employment of a competent full-time faculty and the provision and support of properly equipped laboratories for teaching and research in the basic medical sciences marked the first great advance in medical education. It also greatly increased the cost of operating a medical school.

The justification of increased cost was made clear by the changes that occurred in the teaching programs of the basic science departments of the schools undertaking the new developments. There occurred gradual and continuing changes in viewpoints, objectives, course content, and methodology. Emphasis was placed on the experimental rather than the descriptive approach to the subjects. Large classroom lectures and discussions tended to be replaced by small group conferences. Here, students were stimulated to think and to understand, rather than merely to memorize. More and more attention was given to general principles and their application in clinical medicine. For example, it was found that much of physiology could be taught in terms of human physiology by using the same instruments and procedures that students would later use in the clinical departments. As advances in the basic medical sciences rapidly progressed, and as the advisability of adding new material increased, thoughtful consideration was given to the relative importance of the various elements of the course content.

The establishment of full-time basic science faculties unquestionably better enabled the medical schools to implement their obligation to transmit knowledge. As institutions of higher education the schools were now in a position to assume more fully the additional obligation of expanding the borders of knowledge through the research activities of their staffs. The change in the educational environment that was incident to the research atmosphere so created has been of untold importance in the scholarly growth of medical students.

Development of Clinical Clerkships.—The success of the adoption of these sound educational concepts led to a consideration of their application in the teaching programs of the clinical departments. Didactic exercises and amphitheater clinics provided little opportunity for students to apply their training in the basic medical sciences to the field of clinical medicine.

Perhaps this led to the greatest single advance that has ever been made in the undergraduate clinical training of practitioners of medicine, that is, the development of the clinical clerkships. Students were provided an opportunity to apply their training in the basic medical sciences in the diagnosis and treatment of disease. They acquired training in the proper approach to problems in clinical medicine. They were stimulated to do independent thinking rather than merely to accept and try to remember statements made in textbooks, didactic exercises, and amphitheater clinics. With the large amount of time required for the establishment of clerkships, the clinical faculties were faced with the problem of determining their objectives. Volume of coverage gave way to completeness in the basic training of the students in the proper approach to patients and to the problems of clinical medicine. The number of didactic exercises was greatly reduced, and, with proper supervision, the education and training in the clinical years became individualized.

Teaching and Research Programs.—The dual allegiance of part-time and volunteer clinical teachers to their private practices and teaching responsibilities served to point out the importance of providing a central core of teachers serving on an essentially full-time basis in the major clinical departments. These full-time teachers were needed to provide the desired supervision of clerkships and to initiate the desired research programs. Fortunately, some of the few medical schools that pioneered in the early development of these advanced educational and research programs were producing a group of well-trained clinical men interested in academic careers of teaching and research. Such men frequently served as the key personnel in the development of similar programs in other medical schools. Furthermore, their interest in research and in the advancement of medicine greatly broadened the programs and responsibilities of the medical schools.

At the beginning of these developments only a small part of the medical research in this country was conducted in medical schools. In recent years the great preponderance of scientific advances in medicine have evolved from the research programs conducted in the basic science and clinical departments of our medical schools. At the same time, such advances, together with the development of diagnostic and therapeutic procedures essential to their proper application in clinical medicine, have required a better understanding of the basic medical sciences than was previously considered essential to the successful practice of medicine.

In the conduct of their teaching and research programs, the schools have played an ever-increasing role in establishing the highest possible standards of medical care both in their teaching hospitals and throughout the area in which they are located.

Progress in Medical Care.—All of these developments have enormously increased the cost of operation of our medical schools. However, these increased costs have been fully justified by the fact that in recent years the health and medical care of the public have improved more than in all previous history. Such progress has been the result of the application of the advances in medical science in the training of physicians. Although we must recognize that not all of our medical schools have as yet been able to effect as full a development as desirable of the educational and research advancements to which I have referred, their underlying philosophy and patterns have been recog-

nized as sound. Many schools are in urgent need of the basic facilities, personnel, and financial support for these developments.

If I am correct in this brief outline of the changes that have ocurred in the programs of the medical schools and of the effect of these changes on the advancement of medicine and the medical care of the public, we must retain the lasting values that have been successful in meeting our objectives of providing for the public the highest type of medical care commensurate with the ever-increasing advancements in our understanding of medical problems.

Organizational and Other Support.—Time will not permit any detailed discussion of the various agencies and factors involved in the continuing development and expansion of the teaching, research, and service programs to which I have referred. This continuing development has been due, in part, to the combined and cooperative efforts of the Association of American Medical Colleges and the Council on Medical Education and Hospitals of the American Medical Association, which, during the past 15 years, have worked in ever closer cooperation through the functioning of a liaison committee. Some idea of the extent of the programs of these two bodies is indicated by the changes in their budgets in the past 15 years. The budget of the Association of American Medical Colleges was increased from $31,500 in 1941 to $366,400 in 1956. The budget of the Council on Medical Education and Hospitals increased from $84,500 in 1941 to $410,000 in 1956.

These two organizations, in addition to maintaining close relationships with the individual schools, have worked in close cooperation with the American Hospital Association, the Federation of State Boards of Medical Examiners, and a host of other groups and agencies interested in the advancement of medicine. Without the cooperation of these groups, the medical schools would have found it difficult or impossible to develop their undergraduate and graduate teaching and research programs to the high level they have now attained.

Throughout the entire period of these developments, much of the financial support and stimulus has been provided by philanthropic foundations and the private citizenry of the country. Private industry and governmental agencies have greatly increased their support of medical education and research. Never before have funds for the support of medical research been as readily available to the medical schools as they are today. However, there still remains urgent need for the basic support of many of the schools. The present trend away from categorical and toward unearmarked grants offers unusual promise for the sound and continued advancement of both the teaching and the research programs of the schools.

Criticisms of Medical Education

I would like to expand briefly on some of the present criticisms of medical education referred to in my opening remarks.

Trend Toward Specialization.—To charge the medical schools and their educational programs with responsibility for recent trends toward specialization is to my mind entirely unwarranted. Rapid advances in the field of medicine as well as in other fields of endeavor naturally have led to increased specialization. In fact, failure to specialize would tend to deny to the public the advantages incident to many of these advances. It is true that, especially in medicine and engineering, these trends have presented both educational and service problems. However, whether we like it or not, specialization is here to stay. In medicine we can take much satisfaction in the development and recognition of sound graduate programs for the training of specialists.

Present undergraduate programs in our medical schools are in no way directed toward the training of specialists. As emphasized by the Association of American Medical Colleges, medical schools properly have as their objective the provision of a solid foundation for a physician's continued development, regardless of the nature of his future career in the broad field of medicine. It would be tragic if any sound educational program, basically designed to produce what might be called an "undifferentiated physician," were altered in an attempt to resolve problems of general practice or medical practice in any particular form.

I should like to add that, personally, I have no sympathy with certain efforts to induce a student, upon his admission to medical school, to commit himself to a specific type or location of medical practice.

Neglect of Socioeconomic and Environmental Factors.—Those who accuse the schools of the total neglect of the patient as an individual and of neglect of the socioeconomic and environmental factors related to what is frequently referred to as comprehensive medical care seem to feel that they are advocating something new in medical education. They have probably forgotten that it was a medical educator who half a century ago pioneered in the field of medical social work.

In my own medical school, more than 25 years ago, students serving as clinical clerks began to visit the homes of a certain number of patients assigned to them on the wards of the teaching hospital. This practice is still continued. The specific objective is the study of all of the various factors related to the patient's illness. Experimentation with other carefully considered methods of giving the undergraduate student a proper viewpoint of the importance of these factors is to be commended, as long as such experimentation in no way lessens or weakens what I have referred to as the lasting values of a student's education and training. Probably some schools have tended to neglect consideration of this aspect of medical education. It is my own opinion that, where included, this aspect should be incorporated as a part and parcel of a student's clinical training rather than as a superimposed exercise or assignment.

Under any circumstances we should remember that medical students are probably not as unfamiliar with these factors as some would have us believe. Practically all of them have been members of families for 20 years or more before entering medical school. The need for various forms of student aid suggests that they also have some familiarity with the economic problems of life. Furthermore, as clinical clerks, stu-

dents come into more intimate and continued contact with individual patients and their problems than has occurred before in the history of medical education. Finally, I resent the implication that the clinical teachers in our medical schools are a group of heartless scientists with no interest in the patient as an individual.

Local Opposition to Medical School Programs

The very nature of advances in the teaching of medicine has resulted in the clinical departments playing a more active role in the medical care of the people of the area in which a medical school is located. The policies of the medical schools have been varied in regard to privileges of the essentially full-time clinical faculty to conduct a limited amount of private practice. Some of these policies have been seriously questioned. As a result, in a few instances, certain local medical groups have handicapped or opposed the full development of the clinical departments of schools. These groups sometimes fail to realize that the work of the men on the clinical faculty is essential to the sound progress of medical education and that an attitude of opposition rather than fair and just integration is a real threat to the very structure of modern medical education. Local private pracitioners not only should have an interest in medical education but should have much to contribute to it. The establishment of clear understanding and cooperative relationships between the schools and the local medical profession should work out to the best interests of both groups.

Comment

May I emphasize that our present programs of medical education are by no means perfect and probably never will be. Nor do I believe that uniformity of the details of the curriculum of our medical schools is in any way desirable. I have tried to refer briefly to the advances in the undergraduate programs of the medical schools that I consider to be of such lasting value that they should be carefully guarded less they be diluted or lost. And I believe there is danger of losing them if organized medicine, university administrators, or even medical school administrators yield to popular pressures and attempt to dictate the policies or the educational programs of our medical schools.

Undergraduate medical education must be left in the hands of medical educators, that is, in the hands of the experienced members of the faculties of the medical schools. Only they are in a position to evaluate and deal with the complex problems of laying a foundation for a student's future career as a physician. The time presently allotted to the undergraduate course is already extremely short, especially in view of the rapid advances in certain of the fundamental aspects of medical diagnosis and medical care. Under no circumstances can we hope to give the undergraduate student the maturity, judgment, and attitudes in regard to all of the so-called practicalities of medicine that can only be acquired by his subsequent experiences in his hospital training and practice.

Recognizing that the stated objectives of both medical education and the organized medical profession are the advancement of medicine and the provision of the highest type of medical care possible, I would like to make a plea for medical educators to take a more active part in the activities of organized medicine. Organized medicine needs the assistance and advice of the medical educators of the country in dealing with many of the problems with which it is faced.

Furthermore, I would like to make a plea for organized medicine, through its Council on Medical Education and Hospitals, to confer with the Association of American Medical Colleges in regard to problems relating to medical education. Without such cooperation, even in the face of the best intentions, there may result in the future, as in the past, unilateral actions that may be detrimental to organized medicine, medical education, and the medical care of the public.

There is a host of other groups and agencies, including industry and the lay public, whose support and cooperation are essential to the continuous advancement of medical education and medical care. Surely, if leaders in these important areas of human endeavor approach their joint problems with the sole purpose of seeking resolutions that will best serve the interests of the public, much of the present controversy will disappear.

In closing, may I express the hope that, after this glance over the road that medical education has traveled, you will agree with me that the progress made is indeed worthy of a commendation. So much distance, including the steep hills with many obstacles, has been traversed as to make it clearly evident that our faculties have consistently recognized and chosen the way of lasting values. I have every confidence that they will continue in this advance, pausing only on occasion, to read and intelligently interpret the signs indicating side roads of transient worth.

5842 Alton Rd., Miami Beach, Fla.

Hemosiderosis and Blood Transfusions.—Periodic blood transfusions may be life-sustaining for patients with a refractory, chronic hemolytic, or aplastic anemia, but the necessity of such regular administration of blood is liable in time to result in hemosiderosis. Since every pint of blood carries into the patient's body approximately 250 mg. of iron and since there is no pathway for excretion of iron, the giving of large numbers of blood transfusions gradually leads to the deposition in various organs of the body of considerable quantities of iron which may in time interfere with their functions. Hemosiderosis may affect the bone marrow, myocardium, kidneys and adrenal glands. The liver may become cirrhotic or diabetes may result from siderosis of the pancreas.—H. F. Brewer, M.D., B.Ch., The Hazards of Blood Transfusion, *The Postgraduate Medical Journal*, June, 1956.

ORIENTING MEDICAL STUDENTS TOWARD "THE WHOLE PATIENT"

John C. Whitehorn, M.D., Baltimore

• *In orienting the student to the patient, a major task is to mobilize the common-sense insights that the student has already developed and to help him in organizing them and in examining their relevance to professional operations in the field of health and disease. Visiting the patient in his home is not always better than seeing him in office or hospital settings, unless the student is prepared to overcome the social habits of polite evasion and tactful prevarication and to discuss essential matters with genuine respect, tact, and thoroughness. After such orientation, his course is determined by two general types of factors. One is the practice, counsel, and good example of admired young leaders; the other is the influence of a continued, liberal, humanizing education. The student who is encouraged to use all university resources, liberal as well as technical, is likely to gain a good conception of the physician's responsibility that is implied in the phrase "the whole patient."*

In the strenuous reappraisal of medical education that has been proceeding so vigorously in the last two decades in America, the words "integrative" and "comprehensive" appear with great frequency. These adjectives give expression to efforts at improvement, and they imply some dissatisfaction with medical education and medical practice. The dissatisfaction is pointedly focused upon an educational process that has appeared too fragmented and upon a pattern of medical practice that is stigmatized as too specialistic or too technological. At the same time it is vigorously asserted, and generally acknowledged, that health service in this country is at a higher level of excellence than ever before. Indeed, it seems probable that the enthusiasm over its excellence provides a powerful motivation for proceeding vigorously toward the remedy of the defects in medical education.

The recognition of defects has been stimulated, in some measure, by public criticism. It is not that the public is antagonistic toward doctors. Public attitude surveys show that medicine enjoys a very high prestige. But there are criticisms. Two common criticisms are that individual physicians do not show appropriate human understanding and that the medical profession in general shows little understanding of social processes affecting health. If these criticisms are creditable, they appear to point up some defect in the preparation of persons in the medical profession. There could, theoretically, be an alternative explanation, that persons entering the profession of medicine have little interest in human beings and human problems. Admissions committees are much concerned about the selection of medical students and about the premedical phase of education. There are academic processes that distort this selection and that disorient students to human and social values.

In 1951, in a conference on psychiatry and medical education, sponsored by the American Psychiatric Association, there was submitted a rather extensive review of opinions obtained from a selected list of knowledgeable laymen. A brief quotation from one citizen may serve to epitomize the comments of many. He wrote:

> Many doctors treat their clients as mere patients, rather than as fellow human beings. Many doctors whom I know are congenial fellows, but in their relationships with the patients they give the impression of being hurried. There is a certain assembly line attitude and aloofness to which the patients are keenly sensitive. It is no wonder that . . . quacks by the thousands thrive . . . because they listen, they sympathize and they give the impression of sincerely desiring to help, even though they do not have the proper medical training, if any at all.

Director, Department of Psychiatry, and Henry Phipps Professor of Psychiatry, Johns Hopkins University School of Medicine.

Read before the 53rd Annual Congress on Medical Education and Licensure, Chicago, Feb. 11, 1957.

Critics within the medical profession have been somewhat harsher, pointing up not merely an irritating lack of graciousness and human sympathy but instances of doctors' serious misunderstandings and failures in professional obligations because of the failure to recognize emotional factors in the patient's distress or disability. These critical remarks need not be multiplied. What I have said will suffice to focus attention upon the need, in medical education, for orienting doctors more effectively toward the patient as a person. My discussion shall be concerned most directly with the consideration of how this need may be met.

Role of Psychiatry

There is a common belief that what needs to be learned can be taught. The assertion has been made that doctors do not understand human nature or do not use this understanding in their professional work; hence, somebody should teach them this understanding and how to use it in their work. The task of leadership in such teaching has been assigned to the department of psychiatry in the typical American medical school of today. Why?

First of all, in explanation, it should be said that psychiatrists have been granted such opportunities and responsibilities because they sought them. They felt that they had, in recent decades, developed within psychiatry a considerable body of useful knowledge, theory, and skills regarding personality and the ways of dealing with emotional processes. This body of knowledge seemed to offer to physicians in general a useful basis for understanding and dealing with human nature.

The core of this modern psychiatric insight and working methodology lay in a very simple and elementary proposition, namely, that those oddities of behavior, thought, and feeling that constitute the

symptomatology of the psychotic and neurotic types of illness are found to have human meaning with relevance for human motivation. That is, these oddities are found to be relevant to the issues and conflicts of life. This proposition is usable (and this is the key clause) if one can gain a sufficiently penetrating understanding of the personality and the situation. Psychiatric symptoms have personal meanings, and patients can be helped in their conflicts and in their life situations through the physician's understanding of these meanings. It can be said also that many medical situations involve similar personal meanings and emotional implications, often useful and important in a treatment program.

It is easy to assume the fallacy that when one has penetrated to the meaning one has penetrated to the cause. This vulgar fallacy of identifying meaning and cause has confused the psychiatric literature and has created difficulties in presenting to medical students the basic insights into human nature that have been reliably gained by psychiatrists. This fallacy is commonly compounded with the fallacy that anything that is psychological can, of course, readily be changed. Actually some patterns of expectation and action, developed through significant life experience and repetition, become deeply imprinted and practically unalterable. There is no sure way, other than empirical study and trial, to know which kinds of experientially developed patterns are unmodifiable and which are modifiable, and how.

Knowledge of Human Nature

These brief comments may serve to indicate, in a general way, some of the special difficulties in selecting appropriately the useful and reliable parts of that dynamic knowledge of human nature gained by psychiatrists in their special field. Then comes the task of bringing such knowledge and possible skills to the student's attention and engaging his interest.

The major task, however, in orienting a student to the patient as a person is not instructional in the sense of selecting and presenting information. The major task is to mobilize the common-sense insights that the student has already developed, or almost developed, and to help him in scrutinizing and in organizing his own insights and in examining the relevance of these insights for professional operations in the field of health and disease. To stimulate the mobilization of such common-sense insights in the student, it is useful to set him to work studying examples of human adjustments to illness, particularly examples of good adjustment. He should also seek an understanding of the personality resources that potentiate good adjustment, and of the influences of family and social background favorable to the development of good adjustment potentials. In many ways such an effort to bring to expression the student's own increasing organization of himself in the service of his professional work is analogous to the functions of a liberal education, and probably, in essence, it is identical.

It has appeared to me that the most useful of the general guidelines in the instructional part of this type of program have been those provided by what we know and can sensibly formulate about personality development. Some of the basic ideas can be succinctly stated here.

Human beings, as we know them, are inescapably interdependent. They live with and for one another. Man is not well equipped, biologically, for completely independent living, but he has been provided with emotional potentialities for a life of domestication and socialization. Through the educative experiences thus made possible, individual persons develop their personalities, and thereby their interests, make their basic commitments to values, and acquire, in the process, certain conflicts of interests. They achieve also some measure of maturity for dealing with their responsibilities and opportunities. It is a zig-zag progress, not clearly straightforward. One begins weak and helpless and must, perforce, learn first the domesticated ways of gaining affection and favoritism as a baby. Later, as a child, one develops strength and skills and, in the security of the family's way of life, explores the available range of self-assertive and adventurous behavior; and then later, sometimes much later, one develops responsiveness to others' needs and fills the roles of responsible domesticator and provider.

In the college dictionary, the student can find man characterized as Homo sapiens, and it is good for one to recognize man's sapience. In a wise-cracking mood one may abbreviate it to Homo sap., and surely the doctor needs to understand human folly. But the medical student's dictionary should characterize man primarily as Homo domesticus, a domesticated creature, living in a family and developing, in the family setting, the basic emotional attitudes and conflicts of interests that may later enthuse or bedevil his interdependent existence. These attitudes and conflicts he is likely to carry with him on the job, in the hospital bed, or in the doctor's office. The wise doctor does well to envisage each patient in a domestic frame of reference.

In a number of the current experiments in medical education, the effort is made to get the medical student to cultivate this domestic frame of reference for understanding human nature by assigning him to a family or inviting him into the family situation. This seems like a realistic method of education; yet it may fail. People have been living in homes and passing through the homes of others for a long time, but they may remain extremely obtuse as to the emotional situations existing there. Indeed, for most well-brought-up people, proper manners require a certain degree of obtuseness, just as proper manners in ordinary life require a politely optimistic prevarication in reply to the social greeting "How are you?" There are additional conventions, or cue systems, especially suited to the well-defined roles of doctor and patient, which, for example, permit the patient, but not the doctor, to express how miserable he is. Sometimes these cues get mixed. An addled patient may reply to the doctor's question by denying symptoms, or he may bring forth other polite prevarications, out of inappropriate social habit. Often, the anxious medical student, without the steadying earnestness of clearly defined and fa-

miliar tasks, visits a family and, through lack of a clear role, gets his cue systems mixed. Conversational difficulties may be produced, but also, more frustratingly, matters of emotional significance may not be comprehended, or even observed.

It has been noted that a student, working as a clinical clerk on a ward service, may, through interviews with a patient in that setting, gain a comprehension of a patient's domestic anxieties and tensions that is much more penetrating and usable than that gained by visiting in a patient's own home. Indeed, patients themselves sometimes get a better understanding of their own home situation by getting out of the home and going to a doctor's office for a talk with the doctor. The meaningfulness of domestic situations inheres more directly in the persons than in the house or the furniture. Words truly have their limitations, but the opening of the mouth in speech in a suitably cued situation may yield a more useful understanding of a domestic life situation than can be gained by opening the actual door to the living room, or even the bedroom, and examining the establishment.

The cue systems of the sociability settings in which medical students have learned their manners have provided some conventional prevaricating patterns of tact and of evasive politeness. When one is undertaking the role of physician, however, it is expected that one will have the courage and understanding to discuss many matters not accessible under the sociability cue system, and to discuss them with genuine respect, a special kind of tact, and with thoroughness.

Consider, for example, that the usual polite conventions of conversation or public talk discourage or prohibit the mention or the discussion of the less noble motivations, or the less highly regarded features of personality, such as immaturity; yet how necessary it is to have some comprehensive grasp of these subjects, beyond the superficially polite level, in order to have a professionally useful understanding of the problems of human interaction needed in comprehensive patient care. Students need the guidance of sound and penetrating theory in the deeper understanding appropriate to professional work. They also need emotional support in the early phases of gaining practice and skill in interacting with patients at the more fundamental level.

The medical student, in the clinic or hospital setting, may well feel more poised and secure than on a home visit. He wears a white coat and has his stethoscope at hand, not for stilted show but because he uses it regularly. He has a definite and dignified function and can bring himself more fully into the interview, with a greater likelihood of having a clear head and of being alert to possible emotional issues than when he is in the patient's home, vaguely imitating a social worker or a somewhat indefinable benevolent visitor.

For these reasons and others, it appears to be doubtful that the mere physical entrance into homes brings a very constructive gain for that early phase of medical education designed to provide a basic orientation to human nature. At an appropriate later stage, when he has developed a more secure professional orientation, the young doctor will find in home visits good opportunities for broadening his range of understanding and supplementing his acquaintance with the great diversity of domestic cultures.

Determinants of Integration of Knowledge

Assume that the student has been aided in developing some framework of thought about personality and personality development for orientation to patients as persons, somewhat along the lines already suggested, incorporating as much as possible of his own share of common sense, and that he has received some primary guidance in interviewing patients. One then comes to the crucial conditions that determine whether all this will become an inherent part of the student's working methods or be forgotten and neglected along with much else called basic science. The crucial determinants are of two general types: on the one hand, practice and counseling therein and, on the other hand, some continuation of liberal and humanizing education.

Let us consider first the practice and counseling. One might assume, since all patients are in fact persons, that this simple fact and its major emotional implications would be constantly clear to any student working with patients and that this obvious truism would guide the student aright. I have heard that S. Weir Mitchell, the famous neurologist, when asked to discuss the doctor-patient relationship, remarked testily that all physicians were gentlemen and would therefore know how to manage any personal relationships properly and, if they were not gentlemen, there was nothing that could be done about it. But it is our experience that students, when reasonably well oriented to the possible medical significance of emotional reactions, do encounter problems and do seek guidance about the emotional problems of their patients, whenever competent counselors are readily available in their working situation. In our program at the Johns Hopkins Hospital, we have tried to make such persons available, particularly during the strategic clinical clerkships in internal medicine and pediatrics. Without such guidance and support in evaluating and dealing with emotional factors, the primary orientation would probably be futile or mischievous in effect.

In this connection it should be emphasized that the resident staff in a teaching hospital have a preponderant influence on the student attitudes regarding all the basic sciences. We used to lament the great gap, almost an attitude of opposition, between the preclinical and the clinical parts of medical education, but the causes for lamentation have considerably decreased with the increasing activities of residents and fellows in the fields of basic sciences in close relation to clinical problems. The contagiousness of such interest and respect, as it affects the medical students, has constituted one of the principal integrative forces in medical education. The same general principle holds also in regard to the kind of study given to the patients as persons. The earnestness and effectiveness of such study is like the phenomenon of induction. The student directs his efforts along lines where admired young colleagues lead.

I have mentioned, as a second crucial determinant of the effectiveness of this aspect of medical education, the continuation of liberal and humanizing education. It is trite to say that education is a never-ending effort for anyone in the medical profession. It is also trite to say that, in large part, this continuing education must be self-education. In some medical schools this is not merely a trite remark but a principle of action, and an appreciable portion of student time is reserved for individually directed education, or at least opportunity is maintained for individually selected studies. The earnest pursuit of knowledge and insight into human problems is the natural accompaniment of any vital interest in patients as persons. Individual students and individual doctors do at times find time and method for self-directed enlargement of their liberal education, along humanistic, social, and historical lines. I hope, however, that, in the future, universities will offer more opportunity and encouragement to medical students to use all university resources, liberal as well as technical, for their fuller education; that the medical part of the university may be less a technologically segregated unit; and that, as the need becomes individually apparent, the students may have further opportunities to overcome unexpected inadequacies of earlier phases of education. These measures would assure that the conception of the physician's responsibility that is implied in the phrase "the whole patient" would be granted a greater chance of viability in "tomorrow's medical education."

601 N. Broadway (5).

SCIENCE AND MEDICAL EDUCATION

Dana W. Atchley, M.D., New York

• *Three essential qualities of the ideal physician are that he be a cultivated man, that he be capable of compassionate and perceptive responses, and that, above all, he be a scientist, for it is this quality that distinguishes him from any of the well-veneered and sympathetic practitioners of the healing arts. The primary responsibility of the medical school is the development of scientific understanding, and the curriculum must be oriented more to understanding than to knowledge.*

There is always a certain amount of embarrassment attached to the offering of ideals, particularly if they approach the unattainable. Yet unattainable ideals are valuable when they serve as goals that stimulate and guide progress; they are a handicap only when failure to reach them discourages further endeavor. I shall therefore venture to mention briefly three essential qualities of an ideal physician. We should require of this not-too-hypothetical individual that he be a cultivated man, that he be capable of compassionate and perceptive responses, and, above all, that he be a scientist, for it is this quality that distinguishes him from any well-veneered and sympathetic practitioner of the healing arts.

The exaggerated respect evoked by the healer affords him a remarkable influence, not only on his patients but on his total social area. If he be a person with appreciation of cultural values, familiar with history, liberal in thought, devoted to the finer things, he can exercise an elevating influence of great value in most environments. These assets of a cultivated man are derived essentially from his family and from his education prior to medical school. Our opportunity to further this component of the good physician lies mainly in recognition, by admissions committees, of the candidates who manifest it. I agree with the minority opinion that cultural "bird's-eye" courses are a poor pedagogic approach to this problem in the college years. I prefer a man who has dug deeply into one of the humanities to one who has scratched the surface of many fields; a cultivated man is more a scholar than a dilettante.

Sympathy, compassion, and a quick, warm responsiveness are basic attributes of the healer and have been a major source of his success from first recorded medical history; their value is in no way decreased by the other services the present-day physician has to offer. What was almost the sole contribution of the physician in the previous century is still his main gift in many cases. A self-identifying awareness of the feelings of others is largely an inborn trait, but the influence of a kindly home and exposure to such attitudes in medical school can awaken and amplify this facet of the ideal physician. It is difficult to recognize these qualities with any degree of accuracy during an admissions interview, and, moreover, their absence would not handicap a man headed for an investigative career.

While it is highly desirable for our ideal physician to have culture and compassion, it is imperative that he be a scientist, and therefore the primary responsibility of a medical school is the development of scientific understanding. If the student arrives with a good background the task is easier, but, at best, it is a colossal task and the time available grows less and less adequate.

Role of Science in Medicine

It seems strange that in mid-20th century one should be constrained to enter a defense of the role of science in medicine. Yet presently there are strong movements aiming to dilute the medical curriculum with time spent on attempts to inculcate social respon-

Professor of Clinical Medicine, Columbia University College of Physicians and Surgeons.

Read before the 53rd Annual Congress on Medical Education and Licensure, Chicago, Feb. 11, 1957.

sibility by sending students prematurely into patients' homes. Few students are so inexperienced in human affairs that they are unable to take and interpret a social history. Furthermore, the essence of the problem lies in the impact of the environment on the patient rather than the photographic impression made on the student. A cold-water flat, appalling to the student, may seem a palace to a newly arrived Puerto Rican immigrant, but the same flat would be equally appalling to a family forced by economic disaster to give up their modern apartment. The joy over one change and the despair over the other are the vital material for the physician. Of course, there are circumstances that arise from time to time that require special on-the-spot studies: social, psychiatric, industrial, or epidemiologic. The student should pursue such investigations on his own patients wherever they may lead him, and he should be guided as necessary by the social worker or his instructor.

Another threat to scientific teaching is the pressure to train general practitioners rather than family physicians. In order to sharpen the definition of family physician we have a framed statement hanging in the staff room at the Columbia-Presbyterian Medical Center that reads: "The family physician should supersede the general practitioner, and it is the function of the well trained internist to be the family physician. His role is to know the patient and his environment, to care for him and his family in health and illness, to guide him to specialists when his problems require their skills and at all times to be his counselor and friend." While the size or the limited technical facilities of many communities force some physicians to retain the jack-of-all-trades role that modern medicine has made so unsound, nevertheless, medical education should not retrogress to a trade school process, neglecting fundamental, scientific understanding for the development of a variety of superficial skills. An undergraduate course in general practice is a flagrant anachronism, and the current drive to make rotating internships a legal requirement is a deplorable and shortsighted interference with the best routes to the production of competent practitioners, general or otherwise. If desire or necessity pushes a man into general practice, he must spend as much time as he can (and it will not be enough) in a series of specialized, postgraduate apprenticeships. Such apprenticeships offered in a university hospital would interfere with the responsibililty of the institution to give thorough graduate training in the special fields that modern medicine has made essential to proper patient care. It is a curious paradox that the practitioner attempting to cover the widest area of patient responsibility has customarily been accorded the shortest period of preparation.

Full-time Clinical Teacher and Science

A further example of this current lack of appreciation of the role of science in medicine is the attack by some leaders of the American Medical Association on the full-time clinical teacher. It is beyond understanding that those who have watched the transformation of clinician into scientist in the past 40 years could fail to realize that the single most dominant influence in this change was the introduction of the full-time teacher into the clinical departments. An analogous type of reconstruction occurred when, after the Flexner report a few decades earlier, the basic science faculty was made full time and medical schools changed from third-rate proprietary trade schools to scholarly university subdivisions.

For many centuries the practice of medicine was far closer to the arts of the primitive magician than to the logic of the scientist. Diagnosis was essentially superficial, with much talk about intuition (an impressive exhibition when no check was possible), and the methods of treatment were chiefly inherited, sacred by authority rather than proved by experiment. Fortunately, genius broke through the barriers of superstition and tradition sporadically; Hippocrates denied the divine etiology of disease, Vesalius dared look beneath the skin, Harvey turned attention from morphology to dynamics, and Claude Bernard expounded the experimental method. But even the leading clinicians 50 years ago still purged, sweat, and starved their patients and were proud of being practical men unsullied by contact with the research laboratories of the basic sciences.

Then, gradually, science began to invade the wards. This move cannot be ascribed to a single cause, but those of us who saw it happening believed that the appearance of the full-time clinical teacher was the dominant influence. The relief of the full-time man from practice gave him time for research, and, therefore, men with investigative urge and experience were available for the important academic posts. An almost equally significant concurrent step was the building of laboratories in the hospitals for the clinical faculty to use in their researches. It was a slow, difficult task to overcome the belief among the non-full-time staff that it was not possible to be a good clinician and, at the same time, spend many hours in the laboratory, but after not too many years it was conceded that the critique gained in the laboratory, added to ward and clinic activity, offered strenuous competition to the broader clinical experience of the private practitioner. It is disheartening to see the old struggle reopened on essentially economic grounds.

Contributions of Improved Scientific Atmosphere

What, then, are some of the contributions to patient care that have derived from this improved scientific atmosphere? One of the greatest is the elimination of the sanctity of tradition. No longer is it heresy to introduce new points of view in the management of disease, and there has been almost as much improvement in treatment by what we have discarded as by what we have added. Furthermore, in what we retain we are less and less empirical. Every patient presents a therapeutic experiment, and with a scientific understanding of our purpose we can adapt our programs to variations in individual patients. Another benefit is the elimination of the authoritative *Geheimrat* attitude of the senior men, for science is a most potent democratizing influence. Discussion is open and free. All are aware of the large gaps in their

knowledge and are eager to learn, so patients rarely suffer from a dictatorial error by the chief, and the staff matures through interchange of divergent opinions.

With the remarkably precise organic appraisal that scientific methods make available, we are now able to evaluate, with a new degree of accuracy, the participation of other components, such as heredity, personality, and environment. Indeed, the comprehensiveness of so-called comprehensive medicine depends more on scientific comprehension than on humanistic inclusiveness. The good family physician of 50 years ago was acutely aware of the important role that family, personality vagaries, economics, and ambition played in his patient's health, but the physical machine was largely a mystery, and psychology was wholly intuitive. Today's physician, if he will take the time and trouble to do so, comprehends the total individual to an extraordinary degree and can thank science for this improved vantage ground.

There has been a rather widespread impression, fostered at times honestly, but sometimes maliciously, that a scientific training dries up the milk of human kindness. It is difficult to trace the sources of this palpably absurd belief; perhaps it came from reading about "thinking machines" in science fiction, or perhaps from the unconscious jealousy of men not fortunate in possessing such a training. I have observed many scientifically trained clinicians and also men less lucky in that respect, and I have never seen a sympathetic person frozen by a research career or a cold, tactless individual thawed by general practice.

Education of Medical Scientists

The application of the foregoing discussion to medical education is obvious. In order to ensure the highest quality of medical practice, our first and foremost duty is to graduate medical scientists. This means a curriculum oriented more to understanding than to knowledge, a student body more eager to learn than to be taught, and a faculty with sufficient investigative experience to develop a sound, critical capacity in its students. In addition, well-guided student research can be a tremendous asset in cultivating an appreciation of the philosophy of science.

A program of scientific indoctrination in medical school is greatly aided by a college training that includes courses in mathematics, chemistry, and physics and that, in at least one of these subjects, is advanced enough to give the student considerably more than a superficial understanding of the discipline involved. Furthermore, there is great value in studying one of the humanities in depth. Concentration on Elizabethan literature, anthropology, or the history of philosophy tends to produce a scholar, and the methods of thought of a scholar in any field are much the same as those of a scholar in science.

It is universally agreed among experienced educators that disciplined intellectual power is more valuable than knowledge, that the forming of the mind has priority over the imparting of information. This point of view in no way derogates knowledge per se, but it must be accurate knowledge subjected to careful scientific scrutiny. The successful teacher finds no mutual exclusiveness between the development of intellectual critique and the communication of facts. But facts in a dynamic discipline, such as medicine, are too often dated. Consequently, as the physician leaves medical school further and further behind, he must rely upon himself to appraise the soundness of new information. The scientific critique developed in medical school will be his chief guide in differentiating the true from the false. It is trite but essential in these days of anti-intellectualism to state again that the continued professional growth of the physician depends on the way he has learned to use his mind rather than on what he was able to store in it during medical school.

It is through the processes of science that meaning is attached to otherwise lifeless data. Science transforms the static into the dynamic, makes mechanism more important than morphology, and adds the delightful intellectual savor of understanding. The joy of understanding is both the closest rival of the joy of service and its most effective partner.

The continued flowering of medical science depends on the early recruiting of young investigators. Any tendency to transfer primary pedagogic emphasis from the firm hard-thinking of the natural scientist to the expedient artisanship of the practitioner will tend to discourage the creative mind. This emphasis on science in no way inhibits recognition of the value of compassionate responses. The very nature of social and economic problems calls for exceptional objectivity and austere critique, which are learned best within the university walls.

If the thesis be accepted that a medical student should in the course of his training become a scientist, we must face the very difficult problem of implementing this decision. Probably there is no more fundamental requirement for the attainment of this goal than an atmosphere of research. In every department the student should find evidence of intellectual curiosity, of man's insatiable mind at work, but in addition be should be told the exciting story of the development of knowledge so that he may experience, at least vicariously, the pains and pleasures of exploring the unknown. He should be taught to recognize the type of thinking and the quality of experimentation that has been successful in revealing new facts and relationships. The student should come to realize that, some centuries ago, a curious and thoughtful mind needed less knowledge than courage, but now courage is not so important as familiarity with a basic scientific discipline.

Although it may not be practical to offer a course in logic, there is no profession that needs it more. The undergraduate level of medical school presents the best opportunity to inculcate this invaluable gift. No matter what the subject, it is possible to point out the dangers of careless hypotheses, to contrast *post hoc* with *propter hoc*, and to present the criteria by which scientific evidence is accepted or discarded. There must be appreciation of the dangers of focusing on one variable and the omitting of controls. I have always felt that the clinician has an excellent opportunity when he teaches history-taking to insist that

the data be accumulated according to the rules of logic and expressed with some attention to the precise use of language. As the journalistic tendency of the clinical clerk is moulded into something approaching a scientific analysis of the patient's history, conscious emphasis on the rules of logic makes a more lasting impression than would a course devoted solely to that field.

The role of science in improving management of the most practical problems can be used to illustrate to the student the importance of an understanding of the basic scientific knowledge that at times seems irrelevant to him. The contributions of work on electrolyte physiology to postoperative care, of respiratory physiology to anesthesia, or of renal physiology to urology are examples of material that would orient the alert student in proper fashion.

However, no manipulation of the curriculum and no brilliance of pedagogy can compare with participation in research for the production of a scientific critique. Unfortunately, there is often no time or laboratory space available, and many students have neither the interest nor the capacity for investigation. Nothing is more futile than forced or contrived involvement in a research problem. But the schedule should be sufficiently flexible for the provision of free time to those who do have the interest and capacity, and the faculty should make a conscious effort to indicate the high value of research in the development of a modern physician. Whether the student becomes a psychiatrist, a family physician, or a specialist in a limited area, he will be capable of richer service to his patients if he has, in person, experienced the discouraging but illuminating difficulties that afflict the individual who attempts to widen the perimeter of our knowledge.

Conclusions

As we seek to produce the ideal physician, we can try to select cultivated men and women and we can stimulate a humanistic response by precept and example. But we can create a scientist capable of coping with his evolving discipline only by establishing an atmosphere of sound critical thinking in an environment dedicated to advancing the science that is a physician's unique contribution to man's health and happiness.

180 Fort Washington Ave. (32).

THE PROS AND CONS OF INTEGRATION AND CORRELATION

Oliver Cope, M.D., Boston

• *Three needs of present-day medical education are especially considered: the need of assimilating recently accumulated knowledge, the need of recognizing the emergence of a well-founded psychiatry, and the continuing need of eliminating obsolete modes of therapy. Teaching methods and administrative schemes work only if vigorous teachers are available. Excessive departmentalization causes a loss of educational perspective. Condensation, integration, and the joining of related departments into a division should help to keep the demands on the student within reason; it should assure psychiatry its proper place in the educational plan and help to rid therapeutics of an accumulation of obsolete methods.*

Much has been said and written in the last few years regarding the need for integration and correlation in the teaching of medicine. If the strict definition of these words is employed, there is nothing new about their use in medical teaching. Before examining the pros and cons of reintroducing them or of redeploying them in the present curriculum, let us examine past experience in their use.

One hundred fifty years ago medical education was integrated. It is true that the teaching of medicine and surgery were separate. Medicine was taught by the professor of physick, and surgery by the professor of anatomy and surgery; but the teaching of each subject centered around the patient, and the aspects of the patient's problem were integrated into a whole. So little was known; there was no other way. Medical knowledge had not as yet been splintered off into separate pieces. It was only as knowledge developed that the various aspects acquired a body of knowledge sufficient to be split off and studied as a separate part. Here an integration of a type was employed. As bits of chemical knowledge and understanding appeared, these bits were assembled and integrated into the science of biochemistry. Knowledge of function was later similarly assembled and integrated into the science of physiology. Ideas regarding one organ were correlated with those of another, and laws of function and chemical reaction were formulated. Koch's postulates were an example of such correlation.

Knowledge was rudimentary when each aspect was set apart for separate study. Anatomy, pathology, chemistry, physiology, and pharmacology were in their infancy. Medicine and surgery were no further advanced. Bacteriology dawned as a new science. Pursued as separate entities, these various fields of medicine have undergone prodigious growth of understanding in the past 100 years. Each field of medical science has been assigned the autonomy of departmental structure, and each department has been jealously guarded by its proprietors. As far as medical education is concerned, the integration and correlation of knowledge has awaited the clinical years of medical

Associate Professor of Surgery, Harvard Medical School, and Visiting Surgeon, Massachusetts General Hospital.

Read before the 53rd Annual Congress on Medical Education and Licensure, Chicago, Feb. 11, 1957.

school. Here the clinician, also preoccupied with his special interests, has often faltered and fumbled. The past 50 years have witnessed many delays in the appreciation of the significance of knowledge in one field to that of another. The long delay from the discovery of the sulfonamides to their clinical use is but one example. Better integration and correlation could have hastened the utilization of discoveries in the care of the patient. But would the integration have slowed the development of each science?

Factors Calling for Revision of Approach

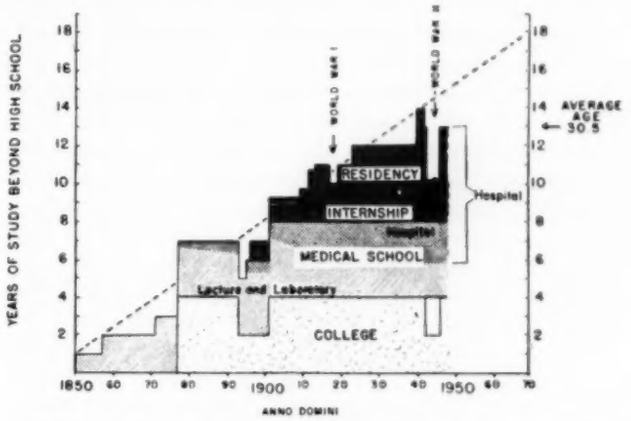
Today three separate factors cry for revision of our present approach to medical education: the huge body of knowledge useful to medicine, the birth of a well-founded psychiatry, and a threatening hoard of obsolete modes of therapy. What is the nature of these and how far will integration and correlation answer the need for revision?

Large Body of Knowledge.—What the growth of knowledge useful to medicine has done to medical education is most readily grasped by looking at the course of medical education over the past 100 years. In 1850 the formal education of the would-be surgeon at the Harvard Medical School and the Massachusetts General Hospital was one year (see figure). With each decade courses have been added and the curriculum has been lengthened. In 1941 his education involved a period of 14 years from high school graduation to the completion of his residency training. When the additions are plotted against the year each was introduced, the lengthening of the curriculum assumes a straight line in terms of time. If this line is projected to 1970 the curriculum reaches the astounding length of 18 years. The curriculums of the general practitioner, the internist, and other specialists have been similarly lengthened.

What has caused this lengthening of the curriculum? As each area of information important to medicine and surgery has been unfolded, and as each new fact and each new technique has been disclosed, all have been dumped into the curriculum, and the necessary months and years have been added to teach them. From time to time systemization of knowledge has reduced the number of isolated facts to be learned, but, on the whole, once something has been added, little has ever been pruned. Certainly no concerted effort has been made recently to discriminate between facts essential to medical education and those less likely to stand the test of time. Those facts less illustrative and therefore less significant to the educational process have not been weeded out. The result is that medical education is now bogged down in a welter of facts, and it threatens to become worse in the near future. Medical knowledge is continuing to grow, and the curriculum will continue to lengthen unless some mechanism is found to halt it. Selection of what is taught is an obvious answer, at least to this aspect of the problem. Has a new application of integration anything to offer? Should the presently highly integrated medical sciences and clinical specialties be broken up (disintegrated, one could call it) and a new structure be composed of parts of each?

At this point, the following question is pertinent: Is it essential that the medical student learn every fact of medical science and clinical medicine? He will not know all later on when he is a practitioner. For example, should every medical student know all the details of the curare group of drugs, every last feature of the electrocardiogram, and the technical details of the management of every fracture of every bone in the body? Would it not suffice if the student learned where curare fits into the scheme of drug action and how it effects the transmission of the nervous impulse, what the electrocardiogram is, with one or, at most, two examples of its use, and the management of one or two fractures as illustrations of the principles of clinical care and bone healing?

Any effort to eliminate areas of knowledge from the medical curriculum meets with stubborn resistance. In general, each faculty member thinks his own particular knowledge is of the utmost importance. It is, of course, to him, since he uses it in his daily work and his achievement depends upon it. It is hard for him to see that some of it may not be quite so important to others.



History of the education program in general surgery at Massachusetts General Hospital from 1850 to 1950. From a length of one year in 1850 the program had reached a length of 14 years in 1940—requiring 4 years of college, 4 years of medical school, 1 year of internship, and 5 years of residency. If no measures are taken to stop the trend, the program would reach a length of 18 years by 1970. (Reproduced with permission from "The Hospital in Contemporary Life," edited by N. W. Flaxon, Cambridge, Mass., Harvard University Press, 1949.)

Careful scrutiny of many of the courses of the undergraduate medical years reveals much hidden detail that could be eliminated without losing sight of the principle that the details illustrate. Does not the chemist teach the detailed steps of more enzyme reactions and demand knowledge of more formulas than are needed to illustrate the broad role of chemistry in medicine? I have already alluded to the curare drugs and the electrocardiogram. Certainly there is no place in the undergraduate curriculum for those technical details of operations that the surgeon is so fond of teaching.

Group teaching offers a ready solution to this problem of weeding out facts nonessential to medical education. If teachers representing two, three, or four of our present departments join in giving lectures, sem-

inars, and clinics, limits are automatically put upon the areas and facts being taught. Such teaching is, of course, a form of integration. Free discussion between faculty members in front of students opens less worthwhile material to criticism. Checks are provided and perspective is gained. We, as individuals, should subject ourselves to searching criticism, but it will be more quickly and soundly arrived at if our colleagues help us in this criticism and we in turn help them.

Well-Founded Psychiatry.—The second factor calling for change in teaching in the undergraduate medical curriculum is the recognition of the significance of the emotional factor in disease and the need for a more effective presentation of psychiatry. The task will not be easy. Mathews and Watkins [1] have said that a strong antagonism to psychiatry pervades many a medical faculty as it does the profession as a whole. But the time has come to square off, face the issues, and not be led astray by ignorance or unwitting prejudice. Emotional factors are to be seen and dealt with everywhere in medicine. I am not speaking at the moment of the psychoses but of the gamut of conditions encountered in medicine and surgery. These range from the psychosomatic diseases to the emotional factor in such everyday complaints as backache, fatigue, and the common cold.

Put in other terms, the thinking mechanisms are an integral part of normal physiology and, when their balance is disturbed, the physiological disorganization may end up in somatic symptoms and changes. Physiologically, there should be nothing mysterious about all this any longer. The importance of getting this into our teaching is, of course, that unless treatment is directed at the origin it will be as ineffective as if the bacteria were disregarded in infectious disease.

The science of psychiatry is, admittedly, in its infancy. To deny it recognition in medical education because it is young and undeveloped would be as illogical as to have denied chemistry its place in medicine 80 years ago. Yet many a clinician stated 80 years ago, and too many since have repeated, that chemistry and "all that science stuff" was the bunk.

Sound concepts in psychiatry have emerged in recent years. Experience in the teaching of these concepts, however, is still limited, and the psychiatrist lacks the confidence of the other teachers of medicine. Group teaching, therefore, offers the best method of integrating psychiatry, not only into medical education but also into medicine itself.

A number of medical schools are experimenting with this approach at the present time. At the Harvard Medical School in 1947 the departments of medicine and surgery organized a collaborative course in "case taking" to introduce the student to the patient during the second half of the second year. Three years later the psychiatrists asked to join in the teaching. For the work with patients, the students were divided into groups of four or five. The psychiatrist did not teach the group alone, but taught four sessions with the internist and four with the surgeon. The patients seen were those on the medical and surgical wards, not those on the psychiatric ward.

Opinion regarding the results was sharply divided. A few of the physicians and surgeons, including senior and junior teachers, counted the time wasted. Either they did not want to see what the psychiatrist had in mind or the psychiatrist did not make his objectives clear. Others were enthusiastic, for they learned to see things they had not seen before, things commonly overlooked in medicine and surgery. And the psychiatrist, forced by his colleagues to reduce his observations to simple terms, improved the organization of his thoughts. A compromise was reached: the joint sessions were not given up, but the number was reduced from eight to six.

Hoard of Obsolete Therapies.—The third reason for modifying the present approach to teaching the undergraduate phase of medicine is the growing hoard of obsolete modes of therapy. Each generation sees new knowledge displace old therapies, but physicians are conservatively educated and cling overly long to outworn ideas. As a third-year student in 1926, I was advised to learn the distribution of sciatic pain that spelled sacroiliac joint disease and for which surgical fusion of the joint was carried out. As an intern, one of the most common operations I was assigned to perform was uterine suspension or ventral fixation. How many of these outmoded and useless operations were performed after it became clear that they served no direct purpose? How many of today's hysterectomies and subtotal gastrectomies are really indicated? There is mounting evidence that the problems of the patients are often better treated in other ways than by such irrevocable operations.

The teaching of a complicated problem such as peptic ulcer is best handled by group or integrated teaching. Discussion and argument to and fro between internist, surgeon, and psychiatrist represents a winnowing by which the significant points are concentrated and outmoded concepts blown off with the wind. The more frequent the discussion, the better the winnowing and the more the student learns.

Issues and Dangers

What I have said thus far favors redeployment of integration and correlation as much for the education of the faculty as for that of the student. The faculty needs to be jostled into a fresh look at medical education, and this is a good way.

There are other seeming advantages to integrated teaching. It is said that integration makes teaching more attractive and speeds the students' learning. These premises are not necessarily true. A dull teacher can be just as dull when teaching with others, and an inspired teacher just as scintillating when teaching alone. A student may also learn just as fast or faster concentrating on a single aspect of a subject at a time. What really counts at the showdown is each teacher's capacity to reach the student, to get him to organize his thinking constructively for the years ahead, and to inspire him.

A principal objection raised to integrated teaching has been that it is too expensive. The unnecessary duplication that group teaching eliminates does not

make up for the additional cost of multiple teachers. But good teaching is always expensive, and criticism, to be valid from an educational point of view, should be based on other issues. Interference with faculty research, interference with the student's own responsibility for integrating, and the instability of an organization depending on voluntary collaboration are such issues.

A danger of group teaching is that it may interfere with the free time of the faculty and thus with research. Time schedules are necessarily a compromise. No one teacher can arrange the schedule for his personal convenience, and each may find his research time intruded upon. Like other scientists, the medical scientist develops his most penetrating understanding when he is free and his thinking is uninterrupted. The departmental structure has provided this uninterrupted time for research.

Too completely integrated a course in medicine deprives the student of the responsibility for doing the integration himself. As in the past, discoveries in the medical sciences will continue to be made in isolated areas. If the student has not been obliged to integrate isolated facts into the whole of medicine, he will have lost an educational experience important later in his years of practice.

The wholly integrated curriculum also denies the student the rewarding experience of studying an isolated science for its own sake. Dr. Atchley (see this issue, page 541) emphasized the value to the student of some experience in research, and this research is the opposite side of the coin. Research is not done in a broad diffuse field, but deep in one area.

A program of group teaching that depends upon voluntary collaboration is unstable, and this is the principal criticism of current efforts in integration. A faculty committee without power of appointment depends upon good will for its effectiveness. But good will is short-lived among prima donnas and busy people in general. It needs constant refurbishing, and this is accomplished only by time-consuming watchfulness. At Harvard, collaboration has repeatedly fallen apart since 1947 in the case taking course because no one has assumed disinterested responsibility. At another medical school on the Eastern Seaboard, combined teaching clinics were instituted enthusiastically just after World War II. Here too collaboration has not been without difficulty, and sometimes a clinic has passed by default to the department of medicine. At Western Reserve, the several committees responsible for the new integrated curriculum are chaired, Dr. T. Hale Ham informs me, each by a vigorous teacher. The chairman is responsible for recruiting the teachers for his special program from among the departments, the departments continuing as heretofore. What will happen when the present chairmen retire remains to be seen, but without power of appointment the position of these chairmen is vulnerable from an administrative point of view. The chairmen are in the position of beggars; they may recruit, but not command. The great advantage of the departmental structure is, obviously, that the department head hires the talent needed, arranges a teaching schedule to fit, and knows that it will be carried out.

Suggested Integration

It is my personal view that the present preoccupation with integration and correlation expresses a dissatisfaction with the organization of subject matter under the present curriculum and that we will make a mistake if we confuse this with a dissatisfaction with departmental structure per se. If this be true, then we should redeploy our departments, and what I have in mind is this: As it now stands there are too many departments. Educational perspective has been lost by dismemberment. This is certainly true of the clinical departments and probably also of the preclinical science departments. No excuse can be offered for the separate departments of the surgical specialties riding off in different directions, teaching whatever comes handy, without planning. All of them, including gynecology and obstetrics, should be reassembled into a single teaching department.

Medicine also is too split apart, and in its integrated form it should include psychiatry. One of the troubles with the teaching of psychiatry thus far has been that it has been given a chunk of the curriculum as if it were a separate subject, like ophthalmology or otology. In a sense it is such a separate subject when it cares for the manic-depressive psychoses and schizophrenia. If the words "thinking processes of the patient" are substituted for "psychiatry," then the subject is as inherent in medicine as cardiac function, and like cardiology belongs in the department of medicine. The teaching of pediatrics, dermatology, and neurology should also be incorporated with the teaching of medicine.

You might well ask why have I not advocated joining the teaching of surgery with that of medicine. As a surgeon, I favor close relations between medicine and surgery, for we too practice medicine. Integrating present-day surgery into medicine, however, is not comparable to integrating the thinking mechanisms and the emotional factors into medicine. Aspects of surgery are as distinct and unfusible with most medical diseases as are the psychoses of psychiatry. Like the psychoses, they are, at present, better studied and taught apart. I, therefore, temper my idealism and shall be content for the time being with reintegrating surgery.

The departments of physiology, pharmacology, and biochemistry teach aspects of function. Would not the presentation be more effective as well as more efficient if they were joined in a division of physiology? The fecundity of research should be increased by the aggregation. The growing field of biophysics would, of course, be included; indeed the division might well be headed by a biophysicist. All members of the division, chemist, physicist, and physiologist, would share the responsibility for teaching general physiology. The chemist would obviously emphasize chemical aspects and the physicist the biophysical.

The introductory teaching of psychiatry should not be a separate course but should be included under the jurisdiction of the division of physiology. The physiologist will have to grapple with the thinking mechanism of the human being as he has with the reactions of the autonomic nervous system. The experimental physiologist Walter B. Cannon [2] described 32 years ago the bodily changes of fear, hunger, pain, and rage. In like manner, the physiologist of the future will study the higher centers of the brain—those peculiar to the human being. Productive starts have, of course, already been made. As far as present teaching is concerned, the physiologist will have to turn to the psychiatrist. Teaching together, the psychiatrist will bring such things as evidence of unconscious influences in thought and the physiologist correlations from established nervous system reflexes. This step of integrating introductory psychiatry with physiology will legitimize thinking as an honorable part of physiology and will free it of the unwarranted but delaying stigmas presently associated with the word psychiatry.

Anatomy and pathology could logically be united and bacteriology joined with them, for administrative purposes, in a division of morphology and microbiology. All three subjects deal with morphology. Much of pathology and bacteriology, particularly immunology, is vividly functional and would secure to the entire division the spur so essential to spirited investigation.

Finally, these condensations or integrations should not destroy the strong advantages of the present departmental structure, and yet they should afford the needed means of pruning the facts taught, of introducing the thinking mechanisms into the pathological physiology of disease, and of ridding the curriculum of obsolete therapies.

20 Hubbard Park Rd., Cambridge 38.

References

1. Mathews, R. A., and Watkins, C.: Resistances Encountered in Teaching Psychiatry in Freshman and Sophomore Years, J. M. Educ. **32**:37-44 (Jan.) 1957.

2. Cannon, W. B.: Bodily Changes in Pain, Hunger, Fear, and Rage, London, Branford, 1925.

THE UNDERLYING CAUSE OF UNREST IN UNIVERSITY MEDICINE

W. Barry Wood Jr., M.D., Baltimore

The most striking characteristic of present-day medicine is its state of intense ferment. A climate of unrest pervades the profession. The uneasiness that is evident on all sides relates not only to our system of medical education but also to medical practice. What, may we ask, is the underlying cause of this unrest?

Some would doubtless attribute it to the upheaval in medical economics, which has been brought about by the rapid expansion of health insurance, and to the phenomenal growth of hospitals, which has stretched to the breaking point the available supply of professional personnel. Others might blame it on the increasing trend toward group practice and the growing strength of full-time staffs in the clinical departments of medical schools and hospitals. Still others would point to the changing pattern of disease, which has resulted from the control of infectious agents, the general increase in longevity, and the new health hazards of an industrial civilization.

In my opinion none of these factors is primarily responsible for the present state of ferment in the medical profession. Rather it would seem to me that the real cause of our present unrest is the rapidly changing dimensions of medical science. It is these that I should like to discuss very briefly. In so doing, I shall make analogies to the conventional dimensions of Euclidean geometry; namely, depth, breadth, and length. The Einsteinian fourth dimension of time will also be drawn into the discussion.

Vice President, the Johns Hopkins Medical Institutions.

Read before the 53rd Annual Congress on Medical Education and Licensure, Chicago, Feb. 11, 1957

• *Medical science has been increasing rapidly in scope and complexity. Medical research has to enlist the services of the whole range of knowledge from surgery to mathematics, and medical practice depends on techniques ranging from physics to psychiatry. As a result, the duration and expense of medical education have increased greatly. The eventual solution of the basic problem must include some shortening of the course for selected medical students, some reduction of the now almost prohibitive cost of medical education, closer collaboration between liberal arts and medical science, and strengthening of the basic science departments of medical schools.*

Depth in Medical Science

Let us begin by considering the depth of medical science. The rapidity with which this dimension is changing is best illustrated by a comparison of two outstanding examples of medical research: one reported from Germany approximately 100 years ago,[1] the other published by American investigators within the past few months.[2]

The first of these examples resulted from the prodigious labors of Prof. Carl A. Wunderlich, head of the medical clinic at the University of Leipzig. At the time that his meticulous investigations were begun, medical thermometry was an unknown subject. Although the thermometer had been discovered several decades earlier, it had never been systematically applied to the study of disease. Wunderlich, accordingly, began to make frequent measurements of body temperature on all patients admitted to his hospital clinic. Over a period of five or six years, he thus studied more than 25,000 patients with a wide variety of dis-

eases. His carefully kept records revealed all the important relationships that are now known to exist between body temperature and the clinical course of the commonest forms of illness. These relationships are clearly set forth in his now famous monograph, entitled "Relationship of Medical Thermometry to the Course of Human Disease." Published in 1862, it had a profound effect upon medical practice all over the world. From it clinicians learned for the first time the true value of the medical thermometer.

As we look back upon Wunderlich's contributions we cannot help but be impressed by their significance. Yet, measured by present-day standards, his studies were purely descriptive; though of vast importance, they were relatively superficial. They made no attempt to get at underlying causes; they merely described the changes in body temperature that take place during illness. And yet they stand today as one of the major medical contributions of the mid-19th century.

Contrast the superficiality of Wunderlich's approach with studies recently reported in the *Journal of Experimental Medicine* relating to the genetics of individual mammalian cells.[2] This work, carried out at the University of Colorado, has involved the use of a tissue-culture method that makes possible, for the first time, the same kinds of studies on individual mammalian cells that bacteriologists have been making for years on various species of bacteria. There are two keys to the new experimental technique: The first involves the use of the enzyme trypsin to dissolve the proteinaceous intercellular cement that causes mammalian cells always to grow in sheets in tissue culture rather than as individual cells. The second has to do with the biochemical conditions in the culture medium, which, it has been found, can be made optimal by the presence of a "feeder" layer of metabolizing but nonmultiplying cells.

Through these two ingenious innovations, it is now possible to grow single mammalian cells on semisolid mediums in ordinary Petri dishes. Each cell placed upon the medium eventually grows into a colony easily visible to the naked eye. The number of cells in each colony can be counted, and thus the rate of cellular division can be accurately measured. The method is exactly analogous to that used in studying the reproductive behavior of bacteria. Its discoverer, Dr. Theodore Puck, has already applied it to an analysis of the mechanism of action of ionizing radiation upon human tissue cells. Certainly in this age of atomic power there is no subject concerning which humanity is more in need of specific information.

Puck's findings may be briefly summarized as follows: First, he has shown that cells derived from a human cervical cancer (the so-called HeLa cells) are many times more sensitive to x-rays than are any other micro-organisms that have previously been studied. In fact, the amount of radiation needed to stop the multiplication of a single HeLa cell is so small that it could not possibly break more than a few chemical bonds in the cell. This quantitative evidence strongly suggests that the radiation acts upon the cellular reproductive apparatus, namely, the gene-containing chromosomes.

Secondly, the observed relationship between the dose of radiation applied and the percentage of survival of cells follows what is known as a typical "two-hit" curve. This fact suggests that the x-rays act upon the chromosomes of the cell rather than upon any single gene.

Thirdly, whereas small doses of radiation will cause only a delay in growth, somewhat larger ones cause the growth to cease after several generations. When the dose of radiation is increased still further, multiplication stops immediately, but the surviving cells continue to grow in size and eventually become giant cells, which metabolize actively and are highly susceptible to virus action, in spite of the fact that they do not reproduce. Finally, it has been shown that only with very large doses can complete disintegration of the HeLa cells be achieved.

These remarkable studies of Puck vividly illustrate the increasing depth of medical science. For here, in contrast to the workers of Wunderlich's time, is a medical scientist probing directly at the very secrets of life itself. Such probings require a depth of knowledge in the life sciences that Wunderlich could hardly have dreamed of. Surely the thesis that medical science has grown, and is continuing to grow, in depth need not be belabored further.

Breadth in Medical Science

Equally impressive has been its growth in breadth. If I may continue to refer to Puck's work for a moment longer, I should like to point out that he is by training a physical chemist, rather than a physician. In carrying out the work that I have briefly described, he has had to make use of many disciplines.

The following points in this regard are of interest. First, the cells that he used in the tissue-culture experiments were originally derived from a cancer of the cervix in a human. Second, in designing his tissue-culture method he borrowed heavily from conventional bacteriology. Third, he made use of a biochemical method to separate individual cells for culture. Fourth, his knowledge of physics aided him in interpreting the biological effects of the x-rays. Fifth, consideration of the quantitative effects of the x-rays involved the use of thermodynamics. Sixth, his work led him primarily into a problem of genetics. And, finally, a fairly complicated method of mathematical analysis was necessary to interpret fully the relationship between x-ray dose and cell survival.

Here, then, is a single example of modern medical research in which the principal investigator has made use of information derived from surgery, microbiology, biochemistry, physics, genetics, and mathematics. The possible practical application of these studies cannot yet be evaluated. Suffice it to say that the studies may well prove to have a bearing upon the understanding of such basic biological problems as those of organ differentiation, the development of congenital defects, the nature of malignancy, the biological effects of radiation, and the intermediary metabolism of individual tissue cells.

Many other examples might be cited to illustrate the fact that modern medical science encompasses all of the basic natural sciences. But what of the social

sciences? Certainly modern medicine involves them also. No physician can fully understand his patients unless he is reasonably familiar with all of the possible environmental factors of illness. Indeed, medicine can perhaps best be defined as a study of the interaction of man and his environment. The important environmental variables that influence his well-being include not only physical and chemical factors but social forces as well. Through psychiatry, particularly, modern medicine has become deeply involved in the social sciences, including such disciplines as social anthropology and social psychology. That medical science is far broader today than it ever was before is evident to even the most casual observer.

Length in Medical Science

Now you will ask, how in the world am I going to drag into this discussion the third Euclidean dimension, namely, length. If you will allow me a little liberty with my analogy, I should like to introduce not only the concept of length but also that of time. For to me the most important practical problem that confronts medicine today is that created by the excessive length of time required to train a modern physician.

As the depth and breadth of knowledge in medical science have increased, the combined undergraduate-postgraduate courses in medical schools and hospitals have become longer and longer. In this country, physicians and surgeons are considered well qualified to practice only after they have completed 4 years of college, 4 years of medical school, and an additional 3 or more years in a hospital—a total of at least 11 years after high school. When two years of compulsory military training are added, many doctors of medicine have reached the age of 30 before they have finished their formal education. Those interested in research have spent a number of their most promising years merely preparing for their careers. This demanding period of training, with its inevitable economic strain, has become so long that it is beginning to discourage candidates from entering the field of medicine. The relative number of students applying for admission to medical schools, as compared to those applying for training in other professions, has been definitely on the decrease.[3] Furthermore, there is good evidence that the excellence of practicing doctors is related, in part at least, to the length and quality of their postgraduate training as house officers. Under the present prolonged curriculum of undergraduate medical education, many young physicians are forced, for economic reasons, to enter private practice before they have gained adequate experience in hospital residencies. Such short-cuts to practice, in this age of expanding science, deprive society of the maximal return on its investment in medical manpower.

Comment

Is it surprising, then, that we as physicians sense within our profession a climate of unrest? The basic problems that face medicine today are the direct result of the changing dimensions of medical science. These problems will not be solved overnight, nor will they be solved in the same way in every institution. Their eventual solution will require wise and imaginative planning on the part of those involved in medical education, in the running of hospitals, and in the practice of medicine.

In an attempt to meet them effectively in our own university, a committee of the medical faculty, working jointly with a small committee from the faculty of philosophy, formulated last year an extensive revision of the educational program of the school of medicine. It would not be appropriate for me to attempt to outline in any detail the proposed plan for the medical school. I would, however, like to state its long-range objectives. They are, very briefly, as follows: (1) to attract a greater number of talented students to the study of medicine by (*a*) shortening the course of training for selected students by two years and (*b*) cutting accordingly the now almost prohibitive cost of their medical education; (2) to break down the presently existing barrier between the liberal arts and the medical sciences, and thus not only liberalize the training of medical students but also bring the school of medicine into closer collaboration with the rest of the university; and (3) to add strength to the basic science departments of the medical school, on the grounds that these departments must, in the final analysis, provide the foundation of clinical medicine and public health. Whether these ambitious objectives can be attained remains to be seen. They stand at present as an impressive challenge to the faculty and students of the school of medicine.

In conclusion, I should like to comment briefly on what we so casually refer to today as "university medicine." Its true significance is perhaps best illustrated by the following quotation from Sir Francis Fraser's prophetic lecture entitled "The Changing Foundations of Medicine" [4]:

> While clinical medicine continues to depend to an increasing extent on physiology and biochemistry, it is looking now for its inspiration and its methods especially to the work of the physicist, the chemist, and the biologist. Without an understanding of these sciences and their recent advances it is difficult to assess the value of much of the new work being carried out in clinical science and being applied to the practice of medicine. In other words, these subjects can no longer be regarded as *pre-medical* in our scheme of medical education, but rather as *pre-clinical* along with anatomy, physiology, biochemistry, pathology, bacteriology and pharmacology.

Thus it is evident, as Professor Fraser so clearly states, that the changing dimensions of medical science are drawing medical schools closer than ever to their parent universities. The degree to which this university bond is strengthened will determine in no small measure the future progress of medicine.

601 N. Broadway.

References

1. Wunderlich, C. A.: On Temperature in Diseases: Manual of Medical Thermometry, translated from second German edition by W. B. Woodman, London, New Sydenham Society, 1871.

2. Puck, T. T.; Marcus, P. I.; and Cieciura, S. J.: Clonal Growth of Mammalian Cells in Vitro: Growth Characteristics of Colonies from Single HeLa Cells With and Without "Feeder" Layer, J. Exper. Med. **103:**273-283 (Feb.) 1956. Puck, T. T., and Marcus, P. I.: Action of X-rays on Mammalian Cells, ibid. **103:**653-666 (May) 1956.

3. Stalnaker, J. M.: Study of Applicants, 1954-1955, J. M. Educ. **30:**625-636 (Nov.) 1955.

4. Fraser, F.: Changing Foundations of Medicine, Pharos of Alpha Omega Alpha **20:**1-9 (Nov.) 1956.

RESEARCH KNOWLEDGE AND ATTITUDES REFLECTED IN MEDICAL EDUCATION

Edward W. Dempsey, Ph.D., St. Louis

• *Teachers who are also competent as investigators are no longer confined to the basic science departments of medical schools but are found in the clinical departments as well. Students can obtain desirable research experience by various informal and formal arrangements, which include programs of summer research or even a year of full-time research in a laboratory of the student's choice after he has finished his preclinical courses. The financial problems can be solved. Grants to institutions that wish to further student research training are available through federal agencies and private foundations. These permit the universities to pay students enough for time spent on research to compensate them when they forego higher-paying work of other kinds.*

Much that I might have said has already been stated by Drs. Weiskotten, Whitehorn, and Atchley (this issue, pages 533, 538, and 541). It seems to me that their comments constitute a most eloquent plea for the furtherance of research training during the time medical students are enrolled in our medical schools. They are also a testimony to the effectiveness of such teaching in furthering the ideals of the medical profession. Consequently, I think now that it is unnecessary for me to defend the point of view that furtherance of our research training is a desirable thing.

I might, however, reiterate some of the comments that have been made. It might be recalled, for example, that Flexner said, in his report on medical education, that there is not, or ought not to be, any essential difference between the attitude of mind of the scientist and of the clinician. Both should be people trained to observe, to reflect on their observations, and to draw tentative conclusions on which they then could base, respectively, an experimental procedure or a therapeutic regimen. Following this intervention, a second period of observation, reflection, and conclusion should be undertaken. In both the experimental and the clinical situation, the mental attitudes are identical.

I would like also to reiterate what has been said earlier, that the clinical research undertaken by medical students during the time they are in medical school, especially in their clinical years, and the use of the methods evolved by and practiced in the basic science departments have formed one of the principal integrating forces in medical education. The activities of such students has brought the basic science teachers closer to those operating in the clinical departments than perhaps any other single force operating in the medical educational institutions of today.

So I take it, then, that we can begin with an agreement that research training for medical students is an admirable thing. The questions remain as to how this training may be implemented most effectively and what special problems, financial, organizational, and otherwise, such a program entails for the medical schools. These problems are interrelated with some others that concern both medical schools and medical practice, the problems of recruitment of teachers in medical schools and the dissemination of the results of research to the profession. Obviously, the larger the number of trained investigators who emerge from medical schools the more rapid and the more skillful will be the introduction of future experimental results into clinical practice.

Forty to 50 years ago laboratory teaching of the type now standard in all schools was recognized as a desirable thing. Gradually, one school after another instituted laboratory teaching, with staffs of basic science instructors. Courses were introduced that replaced the previous didactic exercises. At first there was a small number of such schools. A generation later, about the time that I began to be concerned with medical education, the teachers trained by those original schools had taken effective places in a larger number of institutions. Today, with another generation, one finds that a large number of medical schools scattered all over the United States are now staffed by instructors who are thoroughly competent as investigators, and these investigator-teachers are no longer confined exclusively to the basic science departments. They are to be found in the clinical departments as well. There is now a continuing thread of interest in the investigative attitude and approach that begins from the moment the student enters the medical school and, in most instances, continues far beyond his graduation.

As this increase and spread of talent has been accomplished, there has been a similar increase in the variety of investigative training undertaken by the different schools. One of the most interesting and exciting things about American medical education is its capacity for producing a variety of people who can meet the needs of various local situations and take advantage of the opportunities to be found, while discounting the difficulties that arise in particular local settings.

In any event, a number of tactics have been evolved in the medical schools. Lectures are no longer the kind that used to be given. For instance, in my own

Professor of Anatomy, Washington University School of Medicine.

Read before the 57th Annual Congress on Medical Education and Licensure, Chicago, Feb. 11, 1957.

field, anatomy, it had been the tradition for centuries that lectures were to be orations. This is no longer true. Lectures in most of the departments of anatomy today are concerned not so much with a recitation of fact presented as palatably as possible as with a discussion of the experimental aspects of the subject and an introduction of the experimental material in current journals, which has not yet been incorporated into the textbooks.

Tutorial systems have been introduced in many schools, sometimes under quite informal guises and in other instances in semiformal arrangements brought about spontaneously by the desire on the part of the staff and of the students to engage in informal meetings to discuss experimental work.

Research Opportunities

A number of schools have instituted programs of summer research. This type of program developed more or less spontaneously, by virtue of occasional students approaching staff members and suggesting to them that they were interested in doing some of the kind of work with which the instructors were identified. Out of this kind of casual, incidental, and spontaneous association there has arisen more recently a formalized program at many institutions, whereby funds have been sought to make it possible to encourage students to undertake such activities. A few years ago the United States Public Health Service made it possible to obtain grants for this purpose, and this has immeasurably furthered the development of student research activity.

The summer research program has been criticized by a number of people as being superficial because the period is too short for the best results. It is certainly true that research training should not be superficial. It is, however, also true that the job of capturing the imagination and attention of the student is one that must be undertaken at the appropriate time, and the appropriate time is always the time when the imaginative idea has occurred in the student's mind. So, for purposes merely of introducing the student to the exceptional intellectual opportunities in medicine, I think this program is well justified.

Still other opportunities are available. Many institutions encourage occasional students to take off a year from their regular medical studies. This year normally occurs after the completion of the preclinical courses. The student is encouraged to spend the year doing full-time research in the laboratory of his choice. In many institutions this device has worked very well indeed.

In listing the support available for student research training, one should also mention the postdoctoral fellowship, which, although available after the student has received his M.D. degree, is still used at a time when he is a relative beginner in investigation. Therefore, these fellowships afford an opportunity to undertake serious and sustained work in a laboratory under the direction of a skilled investigator.

There are characteristics common to all of these programs, which have been developed in their various ways and in response to spontaneous demands—sometimes on the part of the student and sometimes on the part of the faculty, who require, to some degree, a close contact with students to help them acquire a sense of fulfillment in their occupations. The programs all cost money. They occupy a considerable part of the time of the faculty and of the student. I believe these two factors have caused much difficulty in the advancement of the programs. It is inescapably true that the medical curriculum is full, that a great many new facets of knowledge have been developed in recent times, and that clearing curricular time at the expense of completeness is not entirely justifiable. Nevertheless, a way can be found, as a way has been found with these spontaneous programs, to make at least a beginning toward an improved method of launching students into investigative work. And, as such programs develop, I am confident that clearance of the time from the curriculum will be possible to an even greater degree.

The financial aspects of the program are not great at the present. However, they are still troublesome. With the present degree of research activity in medical institutions, in most cases it is possible for the laboratories to make places for the occasional students, or groups of students. This represents a secondary use of facilities that have been accumulated primarily for other purposes. Through the activities of the federal agencies and the private foundations, it has also been possible to obtain grants-in-aid. These grants permit the universities to pay students enough for time spent in research during the summer, preventing the necessity of their obtaining higher-paying jobs.

Specifically, I should like to mention here a new program that the Public Health Service is initiating. An Experimental Training Grants Committee has been formed, with money available for grants to institutions that wish to further student research training. This committee has adopted a policy that the furtherance of a variety of kinds of research is advisable. In other words, there is no simple plan that could and should be enforced as the ideal plan for all medical schools.

I mention this to indicate the awareness of the usefulness of this program on the part of the agencies interested in furthering medical research and education. This information is evidence that the spontaneous evolution of the investigative approach to the teaching of medical students, bringing the student-teacher relationship into the research laboratory, has been continuing in the United States. I am confident it will continue over the foreseeable future. I have great confidence that, in this program, the advantages mentioned by Dr. Weiskotten (see this issue, page 533) as accruing from the medical revolution of the past will continue to operate in the future generation.

CLINICAL NOTES

USEFUL PRECAUTIONS IN RADIOGRAPHY FROM THE GENETIC POINT OF VIEW

Israel E. Kirsh, M.D., Hines, Ill.

The recent report [1] of the National Academy of Sciences–National Research Council concerning the biological effects of atomic radiation was quite reassuring as to the fall-out from nuclear weapon tests but raised an alarm in regard to the medical use of x-rays. "The medical use of x-rays should be reduced as much as is consistent with medical necessity," reads one of the recommendations of the genetics committee of the council, headed by Dr. Warren Weaver, vice-president for natural and medical sciences of the Rockefeller Foundation.

As a consequence of this report, given out at a press conference [2] on June 12, 1956, there may be some public anxiety on the subject of x-rays. This situation concerns not only radiologists but physicians in general, who find x-ray studies increasingly valuable and who now are expected to reconsider them in terms of their value versus their danger.

For example, it was advised by the genetics committee that individuals up to the age of 30 years receive a total accumulated dose to the reproductive cells of not more than 50 r and that not more than an additional 50 r be given to individuals up to 40 years of age. For the population as a whole, the average exposure of the reproductive cells to radiation (above the natural background) should be limited up to the age of 30 years to 10 r.

Also in June, 1956, the report of the British Medical Research Council on Nuclear and Allied Radiation [3] was announced. Its conclusions were much the same as those of the National Research Council in the United States. The British group found that the amount of radiation reaching the reproductive organs of the English people through diagnostic radiology was much the most prolific source of artificial irradiation and that the risk of genetic damage from test explosions of nuclear weapons was negligible. They called for a review of indications for diagnostic x-ray procedures and a recheck of conditions under which they are carried out, from the radiation point of view. They advised a critical examination of the use of radiotherapy in nonmalignant conditions. Specifically, the danger of inducing leukemia following radiation of the whole body was noted. The evidence consisted of experiments in animals, the incidence of the disease in Hiroshima and Nagasaki after the atomic bomb explosions, and the increased number of cases of the disease after x-ray therapy in cases of rheumatoid spondylitis.

From the Department of Radiology, Veterans Administration Hospital.

Because of an appreciation of the value of the work on mutations and radiation by Muller,[4] I was able to anticipate some of these warnings and, some time ago, pointed out in THE JOURNAL [5] that two simple measures were effective in decreasing the radiation in x-ray procedures. They are use of adequate aluminum filters in the radiographic machines and fluoroscopes and of lead-rubber protective shields placed over the genitals during radiography.

Protective Shields for the Genitals

Since the publication of that paper, I have found that there was an objection to the use of the lead-rubber shield in that it tended to slip somewhat and might then obscure bony structures of interest. A change was made to plain sheet lead of 1.5-cm. thickness. This was satisfactory, because it could be molded readily to fit over the genitals and remained in place during the examination. When these shields were placed on male patients, no radiation could be measured on the r-meter placed on the scrotum in various x-ray procedures. Therefore, the lead shields have convenience and effectiveness to recommend them in the case of most patients in veterans and military hospitals as well as in 50% of the patients in general hospitals. (This is not readily applicable for female patients.)

Adequate Filtration

The value of adequate filtration in x-ray diagnostic equipment has been shown in the past by eminent authorities [6] in radiology and physics. However, my discussion [5] of the subject was made brief and nontechnical in order to influence physicians who, although not experts in radiation, use x-ray machines and fluoroscopes. Manufacturers of x-ray equipment are now increasingly installing filters in effective amounts (3 mm. Al in fluoroscopes and 2 mm. in radiographic machines) rather than the traditional 0.5 mm. Al, which might be called token filtration.

A question asked at the press conference [2] at which the National Research Council report was given out deserves a serious answer. The question was: In view of the large number of people who receive some radiation in this way, should the chest x-ray survey program for tuberculosis be stopped? The experts at that time did not give a direct answer. In order to have the basis for an answer, it is necessary to know how much radiation the gonads receive in the course of a chest x-ray.

Measurements of such radiation were made at the Veterans Hospital, Hines, Ill., with the use of the conventional chest film and a survey-type photoroentgen

chest examination (two "stereo" films). A Victoreen r-meter was used for making the measurements. This was a freshly calibrated instrument having a scale reading to 250 mr in steps of 5 mr, thus permitting readings to the nearest 1 mr, and made for use in the 60-to-400-kv. range. When the exposure was to be made, the roentgen meter, clamped on a pedestal, was placed between the thighs in contact with the posterior aspect of the scrotum. There was a 2-mm. Al filter on the radiographic tube. A high-kilovolt technique (110 to 125 kvp) is routinely employed for chest radiography, and a thin stationary grid is placed between the patient and the cassette. Slight variations in exposure factors, because of differences in the size of the patients, will not be discussed in detail here. The measurements obtained are shown in table 1.

It will be noticed that the large cone placed on the radiographic tube did not decrease the radiation on the gonads (table 2). A smaller cone of the "double-diaphragm" type was then placed on the tube. In no case was any radiation obtained on the scrotum when this cone was used.

The large radiographic cone first used had an aperture of 11.5 cm. (diameter). The small cone was of the "double-diaphragm" type and had an aperture of 8 cm. The manufacturer states that it contains more than the usual amount of lead, being designed for radiography up to 125 kv. The small cone is now used exclusively at the Veterans Hospital in Hines, Ill. At the 72-in. distance, the transmitted beam fully covers the 14-by-17-in. film.

It is evident, therefore, that the use of a cone will considerably reduce radiation on the gonads in chest roentgenography, but it should be noted that a large cone at such a distance is no better than no cone at all. The cone has to limit the beam adequately to be of any use.

Comment

It is probably wise to reappraise such things as routine preemployment x-rays of the lumbar spine in the absence of symptoms.[7] Reconsideration is also due for such occasional practices as very extensive roentgenologic examinations in the pelvic region, including

TABLE 1.—*Amount of Radiation to Gonads Received in Course of Chest X-ray in Three Male Patients*

	Ordinary Chest Film, r				Photoroentgen Examination (Two "Stereo" Exposures), r	
	No Limiting Cone		Large Cone			
Case No.	Chest	Serotum	Chest	Serotum	Chest	Serotum
1	0.030	0.011	0.036	0.011	3.0	0.020
2	0.062	0.018	0.067	0.009	4.0	0.016
3	0.078	0.018	0.068	0.022	3.8	0.018

the taking of multiple views, the habitual taking of stereoroentgenographs, and the frequent repeat x-rays on patients on a time schedule rather than on the basis of specific individual need.

A relevant fact concerning x-rays in this region is that the radiation reaching the scrotum in an ordinary x-ray (anteroposterior and lateral views) of the lumbosacral spine is 6.5 r with no filter and 1.7 r with a 2-mm. filter.[5] It is to be remembered that, in the male patients studied, a lead shield over the scrotum eliminated the radiation, so that it did not register on our milliroentgen meter.

TABLE 2.—*Amount of Radiation to Gonads Without Limiting Cone and with Large Cone on Radiographic Tube in Course of Chest X-ray in Three Male Patients*

		Dose on Serotum, r*	
Case No.	Dose on Chest, r	No Cone	Large Cone
4	0.036	0.021	0.021
5	0.030	0.012	0.015
6	0.038	0.029	0.012

* No dose with small cone.

Such data as those given above should be available for various x-ray examinations. They should be studied by all those using and recommending x-rays, in the light of current interest in the relation of radiation to genetics.

Summary

The current increased interest in radiation due to nuclear weapons has stimulated a new look at radiation in diagnostic radiology from the genetic point of view. Ionization chambers placed on the scrotum can be easily used to measure approximately the amount of radiation reaching the genitals in diagnostic procedures in male patients. The radiation is reduced significantly by the use of filters and limiting cones in radiographic machines and fluoroscopes. Cones are without value unless they are small enough to keep the direct beam away from the genitals. In male patients, lead shields on the genitals reduce gonadal radiation to insignificant levels.

603 N. Cuyler Ave., Oak Park, Ill.

Mr. Wallace Bergeron, Chief Technician, X-ray Therapy Department, Veterans Administration Hospital, Hines, Ill., made the radiation measurements used in this study.

References

1. Biological Effects of Atomic Radiation: Summary Reports from a Study by National Academy of Sciences, National Academy of Sciences—National Research Council, 1956.

2. United States News and World Report, June 22, 1956. pp. 60-70.

3. Hazards of Radiation: Medical Research Council's Report, Brit. M. J. **1**:1417-1420 (June 16) 1956.

4. Muller, H. J.: Radiation Damage to Genetic Material, Science in Progress, Seventh Series, New Haven, Conn., Yale University Press, 1951.

5. Kirsh, I. E.: Radiation Dangers in Diagnostic Radiology, J. A. M. A. **158**:1420-1423 (Aug. 20) 1955.

6. Morgan, R. H.: Protection from Roentgen Rays, Am. J. M. Sc. **226**:578-586 (Nov.) 1953. Trout, E. D.; Kelley, J. P.; and Cathy, G. A.: Use of Filters to Control Exposure to Patient in Diagnostic Roentgenology, Am. J. Roentgenol. **67**:946-963 (June) 1952.

7. Stewart, S. F.: Pre-employment Examinations of Back, J. Bone & Joint Surg. **29**:215-221 (Jan.) 1947.

COUNCIL ON FOODS AND NUTRITION

Report to the Council

The following paper was presented at the symposium, "The Relation of Proteins and Amino Acids to Human Nutrition," in Los Angeles, May 21, 1956. This symposium was sponsored by the Council on Foods and Nutrition, with the cooperation of the Los Angeles County Medical Society and the School of Medicine, University of California at Los Angeles. This report is the fourth of the series, which will be available in monograph form.

PHILIP L. WHITE, SC.D., *Secretary.*

KWASHIORKOR IN CHILDREN AND ITS RESPONSE TO PROTEIN THERAPY

Nevin S. Scrimshaw, M.D., Ph.D., Moisés Béhar, M.D., Guillermo Arroyave, Ph.D., Carlos Tejada, M.D.
and
Fernando Viteri, M.D., Guatemala, Central America

In its severe form, protein malnutrition is most frequently seen today in young children. Under the name of *síndrome pluricarencial de la infancia* (S. P. I.) in the Spanish-speaking countries, and kwashiorkor in most other parts of the world, a well-defined protein deficiency syndrome is common in children 1 to 5 years of age in most underdeveloped areas of the world. The condition begins to develop as soon as the quantity of protein contained in the mother's milk becomes inadequate for the needs of the growing child. The amount of protein obtained by the nursing infant becomes inadequate sometime after the 8th to 10th month. This inadequacy steadily increases until the time of weaning, when the child is likely to receive a diet containing a high proportion of carbohydrate and little or no protein of animal origin. During this period, the growth and maturation of the child are greatly slowed. If they are fortunate, children in the lower economic groups in underdeveloped areas pass through the pre-school period with little additional external evidence of damage and resume more normal growth and development when they reach school age. Unfortunately, many of these children with underlying protein malnutrition do not escape more serious consequences; they develop the severe protein malnutrition snydrome of kwashiorkor and die from it.

Factors Associated with Development of Clinical Kwashiorkor

Any one of several factors may precipitate the acute episode of kwashiorkor in a child already suffering from malnutrition.[1] One of the commonest is infectious diarrhea, which not only interferes greatly with the child's absorption of nutrients and increases his loss of body proteins but also may cause the mother to further restrict his diet. Frequently the child is given a starchy solution such as rice water or corn starch gruel containing essentially no protein, and strong purgatives are administered to rid him of the worms that the mother mistakenly believes are causing the diarrhea. With such treatment the child is likely to develop frank symptoms of kwashiorkor in two to four weeks.

Other precipitating causes of kwashiorkor in an already malnourished child may be an attack of some infectious disease such as measles or whooping cough, an emotional shock such as the death of a parent, or a worsening of the economic condition of the family. At times the basic diet is so poor that the child gradually develops kwashiorkor without any other identifiable precipitating cause.

Characteristics of the Acute Syndrome

Clinical Findings.—Retarded growth and development as initial clinical characteristics of the syndrome have already been mentioned. Psychic changes include profound anorexia, apathy, and, frequently, irritability. Muscle tone is decreased, and edema may often be severe. The skin changes include atrophy of the skin appendages, areas of hyperkeratosis, and altered pigmentation. The skin lesions are suggestive of those of pellagra but are not confined to areas exposed to sunlight. Secondary infections may result in the development of extensive excoriations. The hair is likely to be thin, brittle, and pale and sometimes acquires a reddish cast. It is frequently sparse and usually can be pulled out easily. Changes in the nails often parallel those in the hair. Various other clinical signs and symptoms associated with concomitant specific vitamin and mineral deficiencies may be present but vary from one region to another.

Pathology.—The pathological changes found at autopsy in fatal cases are often so severe that it is inconceivable that they have come about in the relatively short period of time after either the occurrence of a precipitating cause or the onset of the clinical signs and symptoms.[2] This is taken as further evidence for belief in the widespread existence of an underlying severe malnutrition in underdeveloped areas, even in children who do not manifest the clinical characteris-

From the Institute of Nutrition of Central America and Panama (INCAP).

tics of kwashiorkor. In addition to the lower body weights, most of the organs are grossly underweight, and a monolobular reticulosis of the liver that has taken a relatively long time to develop is seen in about 20% of the cases.

In acute kwashiorkor, the liver is enlarged and shows a fatty change that is often so severe it involves almost every cell and obliterates the lumen of the sinusoids. In some cases the pancreas may be enlarged rather than underweight, but the pancreatic acini always show moderate to severe atrophy and a reduction in the number of secretory granules. Fibrosis is likely to be present in the pancreas and may be severe. Atrophy of the intestine and stomach occurs; it may be very pronounced and associated with a gross dilatation of these organs.

The skin and skin appendages show a marked degree of atrophy, as do also the follicles of the thyroid. In the latter case, there is a loss of colloid substance and an increase in interstitial fibrosis. The skin shows hyperkeratosis and parakeratosis over the area of gross lesions. Atrophy and loss of lipids are apparent in the adrenal cortex, and fatty degeneration of the kidney tubules may be present.

Hematological Findings.—The characteristic anemia appears to be normocytic or mildly macrocytic, and the bone marrow shows relative hypoplasia of the erythroid series.[2a] When hookworm or other conditions producing iron deficiency are present, the child with kwashiorkor may have a hypochromic microcytic anemia with no hypoplasia of the marrow.

Biochemical Alterations.—The positive biochemical findings have been reviewed recently.[3] They include the low activity of the serum enzymes amylase, esterase, lipase, and alkaline phosphatase as well as of the enzymes lipase, amylase, and trypsin in the duodenum. Total serum protein and albumin levels are both greatly lowered, although the relative amounts of alpha$_1$ globulin and gamma globulin seem to be somewhat increased. The values of serum vitamin A, carotene, and vitamin E tend to be very low; those of riboflavin are within normal limits, whereas those of ascorbic acid are usually lowered in the acute disease. Blood serum calcium and phosphorus levels are little altered, but low serum levels have been reported for cholesterol, phospholipids, and urea, whereas the total serum lipid levels and the ratio of free to total cholesterol appear to be high. Kwashiorkor is also associated with low blood serum levels of potassium,[4] but this may be due primarily to the diarrhea.

Physiological Changes.—Nitrogen retention has quite naturally received considerable attention because kwashiorkor develops as the result of a prolonged negative balance. All workers agree that the nitrogen balance becomes strongly positive whenever protein is given in the acute phase of the disease. Children with kwashiorkor also retain a higher proportion of the total nitrogen of the diet than do well-nourished children.[5] The only information on amino acid metabolism shows a reduced excretion of threonine in the urine and higher than normal ratios of isoleucine to leucine and of phenylalanine to tyrosine.[6] Fat retention is lowered,[7] and steatorrhea is usually encountered.

Altered kidney function is indicated by the frequency of oliguria, and altered cardiac function is indicated by electrocardiographic changes. The latter changes include a profound diminution in the amplitude of all deflections and occasional prolongation of the QT interval.[8] There is no information on initial endocrinological changes, unless the oliguria is considered to be caused by a failure of the liver to destroy antidiuretic hormone as is suggested by Gopalan.[8]

Effect of Protein Therapy

The foregoing review of the characteristics of kwashiorkor has been intentionally brief, since more complete recent reviews are available.[3] The principal purpose of this article is to summarize the effects of protein therapy on these initial findings.

Disappearance of Clinical Signs.—When dried skim milk or half-skim milk alone is given, most of the findings show rapid change. In the first 7 to 10 days,

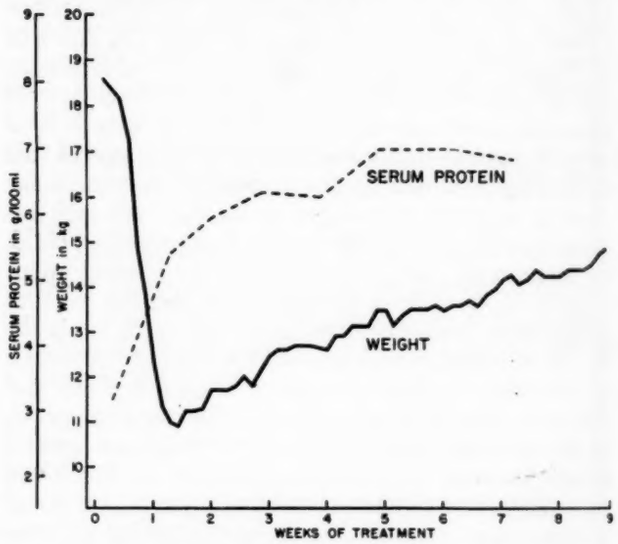


Fig. 1.—Serum protein and weight changes in recovery from kwashiorkor in girl 6 years, 6 months old.

if the child responds to therapy, the apathy and irritability largely disappear and the child's appetite returns. Edema largely or entirely disappears, the skin lesions clear up obviously, new hair and nail substance begin to grow with good color and texture, and the muscle tone improves.

Under ideal conditions, the weight drops rapidly as edema is lost but then begins to climb (fig. 1), and the diarrhea stops promptly. The remarkable change in appearance when severe edema is lost is illustrated by the child in figure 2. The boy in figure 3 shows full recovery, which occurred in 10 weeks of dietary treatment. In less favorable cases, possibly associated with cross infections caused by poor hospital conditions and lowered resistance, intermittent diarrhea continues for many weeks, and the child fails to gain in weight during this extended period.

Considerable evidence is available to suggest that, with reasonable isolation of patients and care to avoid cross infections, most children who recover will do so without the long stationary period in weight. It should be added that some children fail to respond to any kind of therapy, grow rapidly worse, and die. In these

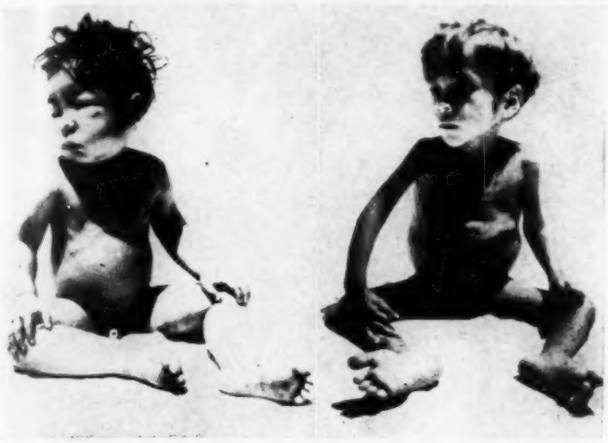


Fig. 2.—Boy 3 years, 10 months of age, showing (*left*) kwashiorkor with severe edema. Five weeks later (*right*) when edema has been lost, considerable degree of undernutrition is revealed.

patients the biochemical and pathological changes described earlier seem to have progressed too far to be reversed. Fortunately, these cases are in the minority.

Hematological Response.—When the mild macrocytic anemia of kwashiorkor is uncomplicated by

Fig. 3.—Boy 2 years, 3 months of age, showing edema, skin lesions, and other characteristics of kwashiorkor (*left*). Ten weeks later (*right*) good recovery occurred with dietary treatment alone.

hookworm or other conditions directly affecting iron metabolism, it responds rapidly to the administration of milk alone. Figure 4 illustrates the prompt reticulocyte response and rapid increase in red blood cell count. In our cases, however, if supplementary iron is not given, a microcytosis develops that can be corrected by the oral administration of iron, which will produce a second reticulocyte response. These changes are accompanied by a renewal of erythroblastic activity in the bone marrow. When microcytic anemia is present initially, supplementary iron must be given from the beginning if a satisfactory hemopoietic response is to be obtained.

Pathological Changes.—Of the reversible pathological changes, only those in the liver can be studied conveniently. From both autopsy and biopsy specimens we know that nearly all the liver cells contain excessive fat in the acute stage of the disease and that the sinusoids are obliterated by the swelling of the cells. Within 3 to 14 days of optimal dietary treatment, this extra fat disappeared in our cases. Figure 5 shows the microscopic appearance of a biopsy specimen of the liver, with partial disappearance of fat, obtained five days after admission in a child with an acute

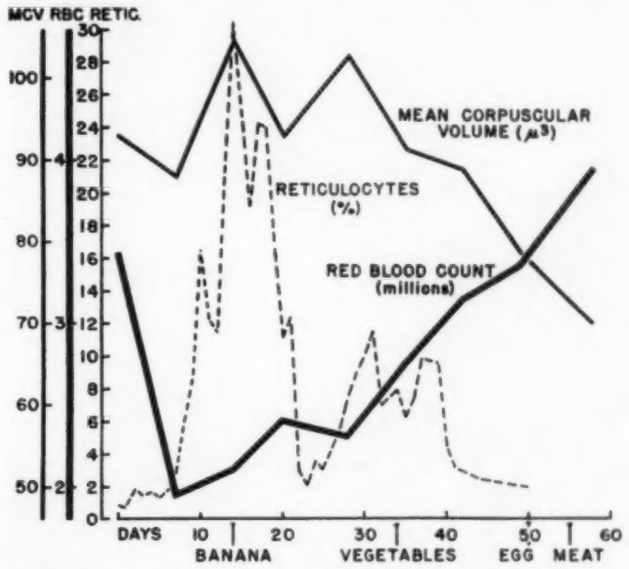


Fig. 4.—Anemia in kwashiorkor. Findings in girl 22 months old given half-skim milk.

case of kwashiorkor. Since fat disappears in the opposite order in which it is laid down, the cells in the center of the lobules are the first to lose their fat. In most cases, when stained with a reticulum stain such as Gömöri, the liver shows a mild to moderate reticulum fiber proliferation. This persists for as long a period of time as we have been able to follow cases, at present a maximum of 15 weeks (fig. 6).

Associated with this reticulum fiber proliferation is an increase in the number of histiocytes in the portal spaces. In some cases a thickening of the walls of the central veins that stains for reticulum and sometimes for collagen is noted. The thickening is different in type from that described by Bras [9] under the name of veno-occlusive disease. In none of our cases has a true hepatic cirrhosis been found. The possible relationship of the reticulum fiber proliferation to fibrosis in the adult is unknown.

Biochemical Recovery.—Changes in levels of certain biochemical substances occur during recovery.

Serum Protein: The prompt response in most cases of kwashiorkor to a diet rich in protein is illustrated for one individual case in figure 1. The average increase in serum protein and albumin levels with adequate treatment is shown in figure 7. A rise in serum albumin from 1.7 to 3.1% and in total serum protein from 3.8 to 6.3% in only two weeks illustrates well the rapid recovery that can take place.

Serum Vitamin Changes: As might be expected, changes in some of the serum vitamin levels are profound. Figure 8 shows the very low levels of vitamin A found in patients upon admission and the gradual rise that occurred as treatment proceeded. This rise was greater when 5,000 units of vitamin A were given daily for the first two to three weeks in addition to the 800 to 900 units contained in the daily diet. The

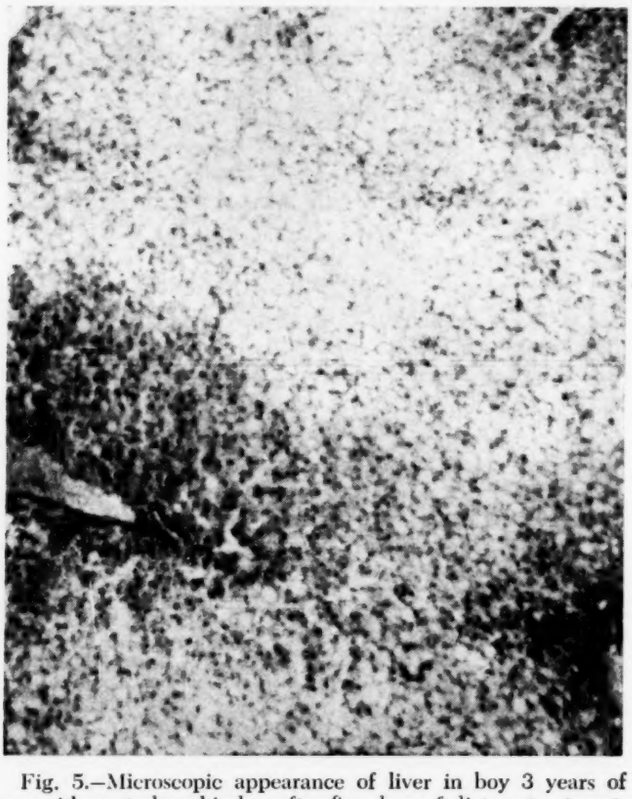


Fig. 5.—Microscopic appearance of liver in boy 3 years of age with acute kwashiorkor after five days of dietary treatment. This section shows disappearance of fat droplets in cells of central portion of lobules. On patient's admission, all of liver cells appeared to contain fat (hematoxylin and eosin stain).

oral administration of a single dose of 75 mg. of vitamin A produced no effect on serum vitamin A levels in children admitted with kwashiorkor.[2a] However, only five days after milk therapy was begun, this oral dose produced a prompt and significant increase in the serum levels of vitamin A. The serum carotene and vitamin E levels, also initially low, rose with treatment.

In general, we have not found the amount of water-soluble vitamins to be greatly lowered in serum. The data summarized in figure 9 show a rise with treatment in the values for both total riboflavin and the so-called free riboflavin fraction. We find that ascorbic acid values also rise with treatment.

Serum and Tissue Enzymes: The rapid rise in the activity of serum enzymes with the feeding of good quality protein is striking. Figure 10 illustrates the increase in serum amylase level that takes place with treatment. Esterase and lipase show similar responses.[3a] All three enzymes have their principal origin

Fig. 6.—Microscopic appearance of liver in boy 5 years of age admitted to hospital with acute kwashiorkor and given four weeks of dietary treatment. This section shows extensive reticulum fiber proliferation commonly seen after clinical recovery (Gömöri stain).

in the pancreas and therefore are useful indicators of the altered pancreatic function in the syndrome and of the recovery in response to treatment.

Figure 10 also shows the rise in levels of alkaline phosphatase and pseudocholinesterase (a nonspecific enzyme that hydrolyzes not only esters of choline but a variety of noncholine esters as well). We have found

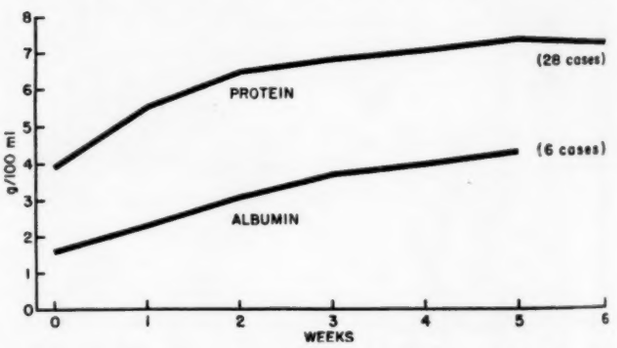


Fig. 7.—Response of serum protein and albumin levels to diet therapy in kwashiorkor.

the latter to be the most sensitive indication of satisfactory response. After an initial drop, alkaline phosphatase level shows a similar rise with treatment.[2a]

Just as this syndrome of protein malnutrition is associated with a widespread decrease in the activity of other enzymes, so is there an equally widespread

and rapid recovery. Waterlow [10] has shown, through a study of liver biopsy specimens from malnourished children in Gambia, British West Africa, that the pseudocholinesterase activity increases more than 100% when a milk diet is given. Although cytochrome

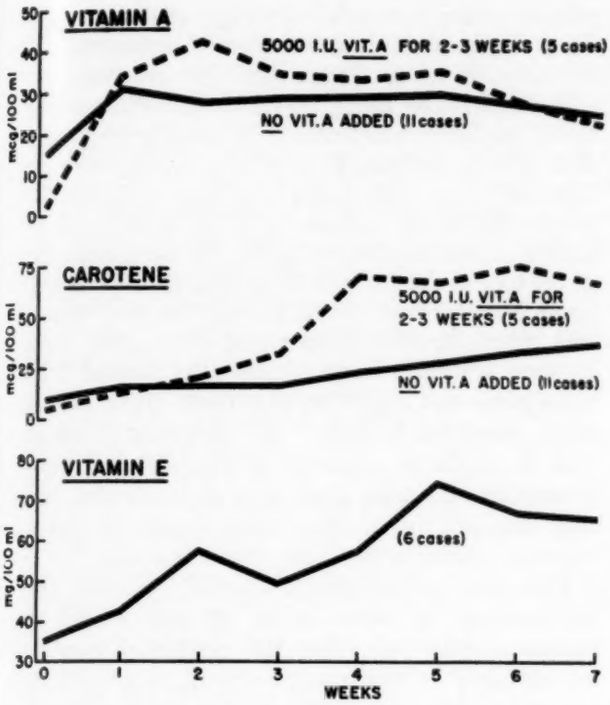


Fig. 8.—Response of serum carotene and vitamins A and E levels to diet therapy in kwashiorkor.

oxidase and lactic dehydrogenase levels are not affected, the level of transaminase in the liver also rises.[10] The alkaline phosphatase activity of liver biopsy tissue increases in kwashiorkor and decreases

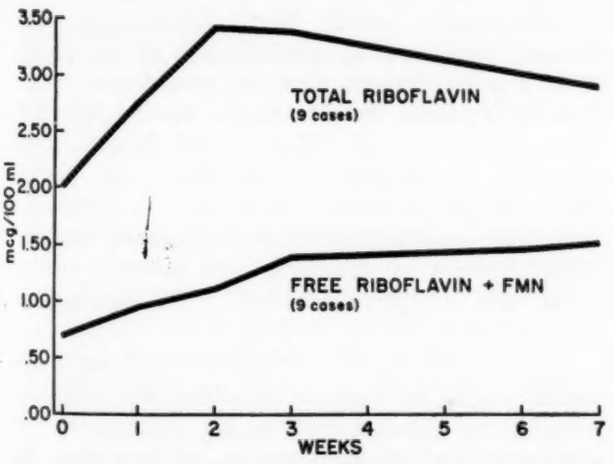


Fig. 9.—Response of serum riboflavin level to diet therapy in kwashiorkor.

with treatment. The duodenal amylase, lipase, and trypsin levels rapidly return to normal in the first 10 days of treatment.[2a]

Other Biochemical Changes: Serum cholesterol values rise rapidly with treatment,[11] and the ratio of free to total cholesterol falls rapidly in the first two weeks. The low-average serum blood urea levels rise to values that exceed the normal level.[10]

Physiological Changes.—It has already been mentioned that nitrogen balance is strongly positive in the early phases of recovery and nitrogen retention is high. In the four children we studied for such data, we found that retentions range between 14.0 and 52.9% even relatively late in recovery. When the child reaches normal weight for height, however, the retention of nitrogen drops sharply regardless of the amount absorbed. The percentage of dietary fat retained decreases in the acute phase of the protein deficiency but rises with treatment.[7a] In our own studies fat retention is variable but does not return to normal even late in the recovery period.[5d] The electrocardiographic changes of the acute phase referred to before also disappear early in recovery.[8] We have recently noted that, when a patient is admitted, the size of his heart is decreased relative to the size of his chest; the heart increases in size with treatment (fig. 11).

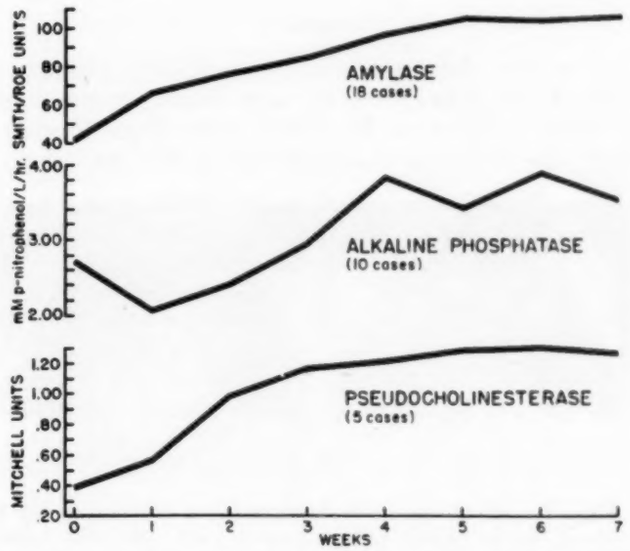


Fig. 10.—Response of three serum enzyme levels to diet therapy in kwashiorkor.

A curious set of findings is occasionally encountered relatively late in recovery. These findings were originally described by Gómez and his group in Mexico under the name of the "recovery syndrome." [12] The liver increases in size, and collateral circulation often is plainly evident, suggesting cirrhosis. An increase in eosinophil count is observed, and hypertrichosis also may develop. It has been suggested that this syndrome is caused by a recovery of pituitary function prior to the recovery of other endocrine organs, with a resulting imbalance. We have occasionally seen this in mild form in Central America, and scattered cases have been reported from other parts of the world. We suspect that this recovery syndrome is aggravated by a high caloric intake with a relatively low proportion of protein.

Relation to Caloric Deficiency

A discussion of protein malnutrition would not be complete without pointing out that it is usually associated with a recent or long-standing deficiency of calories. The cases in which there is a loss of subcutaneous fat and muscular wasting, initially obscured by the edema, are spoken of as the marasmic type of kwashiorkor because they combine degrees of both marasmus or starvation and protein deficiency. In general, these cases are clinically more severe and require longer hospitalization. Since most of the cases of kwashiorkor occurring in Mexico, Central and South America, India, South Africa, and the Belgian Congo are of this type, it is sometimes difficult to separate the effects of protein and calorie deficiency. However, in Jamaica and Uganda, where children may develop kwashiorkor without the loss of subcutaneous fat and muscular wasting, and despite the consumption of an abundance of calories, the changes that have been described as characteristic of kwashiorkor also occur.

Comment

A relative deficiency of protein of high biological value is the outstanding common finding in the diets of children in whom kwashiorkor develops. Furthermore, the principal characteristics of this disease dis-

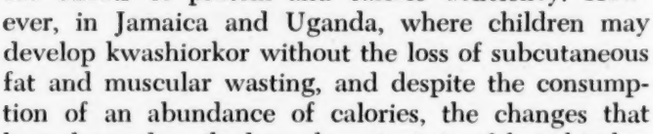


Fig. 11.—Anterior-posterior roentgenogram of thorax in boy 2 years, 7 months of age upon admission (*left*) and with initial recovery well advanced after 14 days of dietary therapy (*right*). Photographs indicate an increase in relative size of heart with treatment.

appear promptly when skim milk alone is given. It is given initially in a dilute form to provide a relatively low level of protein until it is easily tolerated by the patient. The concentration of milk is gradually increased until 4 to 8 Gm. of protein per kilogram of body weight is given by the fifth day, followed by gradual addition of other foods to supply a balanced diet rich in protein. Parenteral therapy is usually unnecessary.

These observations form the basis for considering kwashiorkor to be primarily a manifestation of severe protein deficiency. Further support has been given to this concept by the work of Brock and others,[13b] who have demonstrated that vitamin-free casein alone will bring about an "initiation of cure" including disappearance or improvement of all of the major signs and symptoms. A mixture of 18 amino acids, as in casein, with the addition of glucose, a mineral mixture, and all known vitamins was also effective. Removal of the vitamins did not seriously affect the rate of initiation of cure. Hansen and co-workers[14] have also reported satisfactory initiation of cure with a mixture containing the 10 essential amino acids plus tyrosine, minerals, vitamins, and glucose. When the vitamins were omitted from this mixture, the rate of initiation of cure was distinctly retarded.

A remarkable thing about kwashiorkor is the dramatic rapidity with which it usually responds to a diet rich in protein. It would be suspected, a priori, that children with atrophied gastrointestinal walls whose duodenal enzyme activity is reduced to negligible levels, would be unable to use large quantities of protein at the time of admission to the hospital with acute kwashiorkor. Nevertheless, the response to protein administration is so rapid that a few days later enzyme activities have returned to normal[14] and the absorption and retention of protein given in relatively large quantities is high.[15] The response of serum vitamin A levels to vitamin A administered orally, on admission and after four days of treatment, indicates that the ability of the child to absorb fat-soluble vitamins shows a similarly rapid recovery.[2a]

Our own experience in Central America and that of workers in other parts of the world demonstrates conclusively that the preferred treatment of kwashiorkor is not the parenteral administration of protein hydrolysates, vitamins, or other medical preparations but rather the oral administration, by stomach tube if necessary, of adequate quantities of milk or other sources of protein of good quality. There is reason to believe, from our work and that done in Coonoor, South India, and in Kampala, Uganda, that suitable vegetable protein mixtures are also satisfactory for this purpose.[16]

Occasionally, whole blood transfusion may be deemed necessary to save the life of the child, but it is our experience that, as confidence in simple feeding is gained, the decision to resort to blood transfusion is rarely made. Hansen and Brock[4] have emphasized the importance of fluid and electrolyte depletion, particularly of potassium, in diarrheic children with kwashiorkor. They recommend routine oral administration of an electrolyte solution containing potassium (Darrow's solution) with glucose for the first 24 hours, before starting to feed protein.

The prevention of kwashiorkor must be a goal of public health services and international health agencies, but the detailed study of the characteristics of the syndrome and its response to protein therapy has been enormously helpful in emphasizing the need for prophylaxis. This advancement should also serve to lessen the initial cost of hospital treatment of the condition, by eliminating costly parenteral therapy from the procedures routinely employed, and to shorten the hospital stay, by protecting the malnourished child from the cross infections of the general pediatric ward.

Summary

The characteristics of severe protein malnutrition (kwashiorkor) in children include retarded growth and development, edema, anorexia, apathy and sometimes irritability, hair and nail changes, skin lesions, diarrhea, anemia, lowered serum protein and albumin, lowered serum levels and absorption of fat-soluble vitamins, lowered serum levels of pseudocholinesterase, amylase, lipase and alkaline phosphatase, reduced duodenal enzyme activity, fatty liver, reduced heart size, and lowered electrocardiographic voltages. All of these return to normal or improve greatly within the first 7 to 10 days of protein therapy, apparently even when this therapy is given in the form of vitamin-free casein. Suitable vegetable protein mixtures may also be used.

Children exposed to cross infection in open pediatric wards require longer hospitalization for satisfactory recovery. The associated deficiency of other nutrients can be corrected by diet alone except when severe iron deficiency caused by malaria or hookworm is present; in that case, supplementary iron should be given orally. There is no convincing evidence that vitamin B_{12}, lipotropic substances, or enzyme preparations have a place in the treatment of kwashiorkor.

This investigation was supported in part by a research grant from the National Institute of Arthritis and Metabolic Diseases, Public Health Service, and by funds from the Nutrition Foundation, Inc., the Williams-Waterman Fund of the Research Corporation, and the World Health Organization. This paper is INCAP Scientific Publication I-65.

References

1. (*a*) Autret, M., and Béhar, M.: Síndrome Policarencial Infantil (Kwashiorkor) and Its Prevention in Central America, FAO Nutritional Studies no. 13, Rome, Food and Agriculture Organization of the United Nations, Oct., 1954. (*b*) Scrimshaw, N. S.; Béhar, M.; Pérez, C.; and Viteri, F.: Nutritional Problems of Children in Central America and Panama, Pediatrics **16:**378-397 (Sept.) 1955.

2. (*a*) Scrimshaw, N. S., and others: Characteristics of Kwashiorkor (Síndrome Pluricarencial de la Infancia), Fed. Proc. **15:**977-985 (Sept.) 1956. (*b*) Footnote 1*b*.

3. (*a*) Trowell, H. C.; Davies, J. N. P.; and Dean, R. F. A.: Kwashiorkor, London, Edward Arnold & Co., 1954. (*b*) Footnote 2*a*.

4. Hansen, J. D. L., and Brock, J. F.: Potassium Deficiency in the Pathogenesis of Nutritional Oedema in Infants, Lancet **2:**477 (Sept. 4) 1954.

5. (*a*) Bray, B. M.: Nitrogen Metabolism in West African Children, Brit. J. Nutrition **7:**3-13, 1953. (*b*) Holemans, K., and Lambrechts, A.: Nitrogen Metabolism and Fat Absorption in Malnutrition and in Kwashiorkor, J. Nutrition **56:**477-494 (Aug.) 1955. (*c*) Gómez, F., and others: Protein Metabolism in Chronic Severe Malnutrition (Kwashiorkor): I. Absorption and Retention of Nitrogen from a Typical Diet, to be published. (*d*) Robinson, U., and others: Protein and Fat Balance Studies in Children Recovering from Kwashiorkor, J. Trop. Pediat., to be published.

6. Cheung, M. W., and others: Observations on Amino Acids Metabolism in Kwashiorkor: A Preliminary Report, J. Trop. Pediat. **1:**141-147 (Dec.) 1955.

7. (*a*) Gómez, F., and others: Studies on Undernourished Child: XX. Fat Absorption in Chronic Severe Malnutrition, to be published. (*b*) Footnote 5*b* and *d*.

8. Protein Malnutrition, Proceedings of a Conference in Jamaica, 1953, Sponsored Jointly by the Food and Agriculture Organization of the United Nations, the World Health Organization, and Josiah Macy, Jr. Foundation, London, Cambridge University Press, 1955.

9. Bras, G., and Watler, D. C.: Further Observations on Morphology of Veno-occlusive Disease of Liver in Jamaica, West Indian Med. J. **4:**201-211 (Dec.) 1955.

10. Waterlow, J. C.: Enzyme Activity in Human Liver, Liver Injury, Transactions of the Eleventh Conference, April 30-May 1, New York, Josiah Macy, Jr. Foundation, 1953, p. 72.

11. Dean, R. F. A., and Schwartz, R.: Serum Chemistry in Uncomplicated Kwashiorkor, Brit. J. Nutrition **7:**131-147, 1953.

12. Gómez, F.; Ramos Galván, R.; and Cravioto, J.: Estudios sobre el Niño Desnutrido: VIII. El Síndrome de Recuperación Nutricional, Hospital Infantil de México, n. d. (Trabajo de Investigación Realizado en el Hospital Infantil de México).

13. (*a*) Brock, J. F., and others: Kwashiorkor and Protein Malnutrition: A Dietary Therapeutic Trial, Lancet **2:**355-360 (Aug. 20) 1955. (*b*) Hansen, J. D. L.; Howe, E. E.; and Brock, J. F.: Amino Acids and Kwashiorkor, ibid. **2:**911-913 (Nov. 3) 1956.

14. Véghelyi, P. V.: Pancreatic Function in Different Clinical Conditions, Acta paediat. **36:**483-490, 1948.

15. Footnote 5*c* and *d*.

16. Protein Requirements and Their Fulfillment in Practice, Proceedings of a Conference in Princeton, New Jersey, 1955, Sponsored Jointly by the Food and Agriculture Organization of the United Nations, the World Health Organization, and Josiah Macy, Jr. Foundation, to be published.

High-Altitude Polycythemia.—Studies of high-altitude polycythemia have been carried out largely in the Peruvian Andes, where many people live at altitudes of more than 12,000 feet. When normal persons move to high altitudes, they undergo a period of acclimatization marked by an initial hemoconcentration, with increased values for hemoglobin and the cell-volume per cent (hematocrit) and an increase in the number of erythrocytes; there is no immediate increase in the total erythrocytic mass, although this does occur some days later. Rates of turnover of plasma iron, however, increase greatly in the first 12 hours at high altitudes. This occurs more quickly than can be observed in studies of the peripheral blood and bone marrow. Reticulocyte counts reach a peak in about a week. Natives living at high altitudes show increased total erythrocytic masses, with normal plasma volumes. The rates of turnover of plasma iron are not so high as those of persons recently arrived in the region. On descent from high altitudes, a pronounced decrease occurs in the rate of erythropoiesis (as indicated by decrease in the turnover of plasma radioiron), the rate often decreasing to values less than normal. Splenomegaly is uncommon in natives living at high altitudes, and the leukocyte and platelet counts are not increased.—C. F. Stroebel, M.D., and W. S. Fowler, M.D., Secondary Polycythemia, *The Medical Clinics of North America*, July, 1956.

THE JOURNAL
OF THE AMERICAN MEDICAL ASSOCIATION

Edited Under the Direction of the Board of Trustees

Editor and Managing Publisher . . AUSTIN SMITH, M.D.
Associate Editor . . . . . JOHNSON F. HAMMOND, M.D.
Assistant Editors . . . . . WAYNE G. BRANDSTADT, M.D.
FREDERIC T. JUNG, M.D.
EDWARD R. PINCKNEY, M.D.
Assistant to the Editor . . . . . MILTON GOLIN
Editor for Medical Literature Abstracts . . GEORGE HALPERIN, M.D.
News Editor . . . . . CHARLES CHAPMAN

Subscription price . . Fifteen dollars per annum in advance
Cable Address . . . . . "Medic, Chicago"

NEW PROBLEMS FOR PHYSICIANS

Elsewhere in this issue of THE JOURNAL (page 566) is a report on some aspects of the Old-Age and Survivors Insurance disability program. The American Medical Association has opposed consistently amendments to the Social Security Act leading to such a program. Physicians throughout the country have been warned of the problems that inevitably will arise because of this program. However, in spite of these and other warnings, the program is now covered by law, and many physicians and many patients will increasingly be made aware of it as medical reports are prepared for the Bureau of Old-Age and Survivors Insurance.

The report appearing elsewhere in THE JOURNAL is intended to supply physicians with information on what the program entails. It was prepared under the direction of a special committee of the Board of Trustees of the American Medical Association, the Committee on Medical Rating of Physical Impairment. One aspect of the program which must be understood, even though it may not be acceptable to many, is the role of the physician as he assists his patient applicant: he merely assists in providing the administrative agency with a written report of clinical findings and medical facts. The administrative agency will determine whether the applicant's condition qualifies him medically as disabled under the program.

Other points of special interest include:

The term "permanent and total" disability does not appear in the statutory definition of disability. So, while this program is popularly referred to as a "permanent and total" disability program, such reference is not an accurate one.

An individual is not necessarily eligible under this program even though he may be considered "permanently totally disabled" under another private or public program.

The degree of participation by the medical profession in the selection of medical personnel and the development of medical policies and practices of the state administrative agency depends on the relationship between the agency and the medical profession at the state level.

It is the applicant's responsibility to obtain, at his own expense, sufficient medical evidence to prove his disability.

Consultative examinations at government expense may be authorized to verify the medical evidence submitted by the applicant or to provide additional medical data needed to confirm the diagnosis or severity of the applicant's present condition.

The applicant's attending or examining physician may be authorized by the state agency to develop, at government expense, this additional medical data needed to confirm the diagnosis or severity of the applicant's present condition.

An administrative agency may adopt a policy that the physician making the consultative examination must be mutually acceptable to both the applicant's attending or examining physician and the medical personnel of the administrative agency authorizing the consultative examination.

The Committee on Medical Rating of Physical Impairment was appointed as an *ad hoc* committee of the Board of Trustees on September 14, 1956. Committee members are James R. McVay, Chairman, Kansas City, Mo.; George F. Gsell, Wichita, Kan.; Henry H. Kessler, Newark, N. J.; Quentin W. Mack, Boise, Idaho; and O. A. Sander, Milwaukee.

The committee's objectives are as follows:

To establish guides for medical rating of physical impairment, and lists by body systems of permanent impairments and their relation to permanent total disability.

To provide liaison between the American Medical Association and the Bureau of Old-Age and Survivors Insurance on medical aspects of its program for the disabled.

To study such other programs for the disabled as the committee may find of value in performing its duties.

To inform constituent medical associations of current activities of the committee.

The committee has met several times. With the assistance of consultants, it has begun its work. But it will need the understanding of the medical profession as this program develops. Without such understanding, problems for the patients and their doctors will be made more acute.

TOLBUTAMIDE FOR DIABETES MELLITUS

The release of the orally given hypoglycemic agent tolbutamide (Orinase) for prescription use in the management of selected cases of patients with diabetes mellitus imposes new responsibilities on the physician. While tolbutamide may make unnecessary the routine use of insulin in many such patients, it is mandatory that the physician acquaint himself with the details of

selection of patients and their management with this drug. In patients with a satisfactory response to tolbutamide, the blood sugar level falls, glycosuria diminishes, and such symptoms as pruritus, polyuria, and polyphagia disappear; however, failure to observe recommended precautions can cause deterioration of the patient's state of health and well-being.

This drug is a member of the sulfonamide family and carries with it a risk for some patients, even though apparently slight, because of its chemical structure. The real and more serious problem, however, will arise if the drug is dispensed without a prescription for self-medication or if it is used in patients for whom it obviously is not indicated. Tolbutamide is not a substitute for insulin and must not be used in the juvenile type of diabetes. Such insulin-dependent diabetics must depend on hormonal replacement therapy in addition to careful dietary regulation. Tolbutamide is of no value in diabetes complicated by acidosis and coma; here insulin is indispensable.

Any physician using tolbutamide should insist that during the initial test period the patient report to the physician daily and for the first month report at least once weekly for physical examination, blood sugar level determinations, and white blood cell count. After the first month the patient should be seen at least once a month and the above studies carried out.

For the protection of both patient and physician, uncooperative patients should not be considered suitable for treatment with tolbutamide. Since not all patients with diabetes mellitus are suitable candidates for therapy with this drug, it is essential that the physician know the limits of application and the criteria for selecting patients for treatment with it. It is especially important for the patient not to develop a careless attitude, because it will result in serious health consequences and failure of treatment. The use of tolbutamide gives no diabetic license to ignore dietary restrictions, and all of the usual diagnostic and therapeutic measures necessary to insure optimal control of the diabetic state with insulin are equally necessary for control with this drug.

The following precautions must be observed: 1. The patient on tolbutamide therapy must receive full and complete instructions concerning the nature of his disease and what he must do to prevent and detect complications and to control his condition. 2. He must fully understand that he cannot disregard instructions relative to body weight, exercise, personal hygiene, and avoidance of infections. 3. He must be informed about how and when to test for glycosuria and ketonuria and how to recognize and counteract impending hypoglycemia. 4. He must be informed that treatment only controls rather than cures diabetes and that, for good control to be maintained, directions regarding diet and dosage of the drug must be followed rigidly. 5. Care must be exercised to avoid ketosis, acidosis, and coma, especially during the trial period when insulin is being withdrawn.

Use of tolbutamide is contraindicated in patients having (1) juvenile or growth-onset type diabetes mellitus; (2) unstable or "brittle" type diabetes mellitus; (3) history of diabetic coma; (4) maturity-onset diabetes complicated by severe ketosis, acidosis, diabetic coma, severe trauma, gangrene, Raynaud's disease, or serious impairment of renal or thyroid function; (5) hepatic dysfunction; or (6) diabetes mellitus adequately controlled by dietary restriction.

The diabetic patient whose condition is most likely to be tolbutamide-responsive is one in whom the disease is relatively mild and stable and developed some time after the age of 30 years. Responsiveness is measured by a satisfactory reduction in blood sugar level and glycosuria during the trial period, which should be continued for five to seven days provided ketosis does not intervene. The patient is considered nonresponsive to tolbutamide if any of the following conditions develop: ketonuria, glycosuria, unsatisfactory decrease in or persistent hyperglycemia, serious side-reactions, or failure to obtain subjective or objective clinical improvement.

The recommended dosage for tolbutamide therapy in a suitable candidate, whether he is or is not receiving insulin, is as follows: on the first day, 3 Gm.; on the second day, 2 Gm.; on the third day, 1 Gm. On occasion, depending on the clinical response, dosage is decreased more slowly, but this period should not exceed one week. Thereafter, the daily dose, which can be given as a single dose each morning or in divided doses, is adjusted as required to obtain optimal control. The ultimate maintenance dose may be as little as 0.5 Gm. daily or as much as 1.5 Gm. daily. The usual maintenance dose is 1 Gm. Maintenance dosage over 2 Gm. should be avoided.

When patients receiving insulin are converted to tolbutamide therapy, insulin should be withdrawn slowly and its administration not stopped abruptly. During the withdrawal period the patient should test his urine for sugar and ketone bodies as often as three times daily and report the results to his physician daily. Patients whose insulin requirement is less than 40 units daily may be started on tolbutamide therapy with a concurrent 30 to 50% reduction in insulin dose, with further daily reduction of the insulin as response to tolbutamide is observed. In patients requiring more than 40 units of insulin daily, tolbutamide therapy may be initiated in conjunction with a 20% reduction in insulin dose the first day, with further careful withdrawal of insulin as response to tolbutamide is observed. The too rapid conversion from insulin to tolbutamide may result in aggravation of the diabetic state and ketosis, even in those patients whose insulin requirement is small. During the conversion period, hypoglycemic reactions may occur; these are readily controlled by the administration of glucose or by modification of the dose.

Combination tolbutamide-insulin therapy is rarely useful or necessary, and it is not recommended. All patients who develop ketosis or serious side-effects

other than hypoglycemia or in whom unsatisfactory blood or urine sugar level control results should have tolbutamide withdrawn and be returned to their former insulin therapy.

During the course of intercurrent complications, such as ketoacidosis, severe trauma, major surgery, infection, severe diarrhea, and vomiting, supportive insulin therapy becomes mandatory. Depending on the severity of the diabetes, the nature of the complications, and the availability of laboratory facilities, tolbutamide therapy may be continued or may be withdrawn while insulin is being used. However, if tolbutamide is not withdrawn, extra care must be exercised to avoid hypoglycemic reactions. Because insulin is indispensable for the management of complications, all patients receiving tolbutamide should be carefully instructed in the proper use of insulin.

The use of members of the sulfonamide family for their hypoglycemic effect has been studied for some years. One agent is now sold in Canada, and the drug can be obtained in other countries. In the United States at least two have been studied extensively. One has been withdrawn even for experimental use; the other, tolbutamide, is now available since the Food and Drug Administration has made effective a new drug application. Much work has been undertaken as this substance has been studied. More, however, remains. For example, what may happen when the drug is administered for many years remains to be seen. In the meantime, physicians must warn their patients that this drug is not a true substitute for insulin but in carefully selected patients can be used instead of insulin to control the blood sugar level. If the patients are not warned properly, if they do not cooperate, or if the prescribers of the drug do not understand its limitations, trouble will inevitably arise.

NATIONWIDE NATIONAL HEALTH SURVEY BEGINS

The National Health Survey program has progressed to the point that field work on household interviewing began, nationwide, on May 6. The survey represents the first effort in 20 years to obtain comprehensive statistics on illness in the general population.

The Public Health Service is undertaking the survey on a continuing basis pursuant to legislation enacted in the last session of the Congress. There has, of course, been increasing recognition for some time of the fact that, for the general population, information on health conditions is seriously out of date. An important step toward remedying this situation was the establishment in January, 1949, of the U. S. National Committee on Vital and Health Statistics. Two successive *ad hoc* subcommittees were set up by the chairman of the national committee "to frame the problems in morbidity statistics, including chronic diseases and medical care statistics, in order that morbidity data may be directly related to demographic factors." These subcommittees recommended the study of a number of methodological questions, and in several community surveys a start was made in the investigation of some of these questions. A third *ad hoc* subcommittee was created in 1951 and charged with the task of drafting "a plan for a national morbidity survey keeping in view the interests of local areas." The report of this subcommittee, "Proposal for Collection of Data on Illness and Impairments: United States," [1] became the basis for the new National Health Survey law (P.L. 652, 84th Congress).

The legislation was sponsored by the administration and enjoyed bipartisan endorsement. The American Medical Association supported it, while cautioning that any survey in this area should be conducted in such a manner that all interested parties can agree substantially with its conclusions. The House Committee on Interstate and Foreign Commerce embraced this caution, repeating it in its report on the measure.

Operation of the survey is centered in the Public Health Service's division of public health methods. Dr. Forrest E. Linder, formerly of the National Office of Vital Statistics and more recently chief of the demographic and social statistics branch of the United Nations Statistical Office, has returned to the PHS as the survey director. Dr. Alice M. Waterhouse is staff medical advisor. The survey program will have the benefit of a national advisory committee composed of representatives of medicine, dentistry, hospital administration, biostatics, labor, insurance agencies, pharmaceutical houses, and other interested disciplines and groups. The American Medical Association will be represented on this committee by Dr. Henry B. Mulholland of the Council on Medical Service, with Mr. George W. Cooley of the Council staff serving in a staff capacity to Dr. Mulholland.

The survey program will consist of three parts: a continuous sampling of households on a national basis, information being collected in each household by carefully trained and supervised lay interviewers; a series of special studies to gather information of a type for which a household interview method is not appropriate; and a series of methodological studies designed to improve the techniques of measurement of illness and to check the validity of data collected in the interview survey and special studies.

The household interview is the first of these parts to get under way on a full scale. The field work for this part of the study will be conducted for the public Health Service by the Bureau of the Census. At the beginning, the interviewing will be done in 330 Census Bureau primary sampling units, which consist of counties, parts of counties, combinations of counties, or metropolitan areas chosen to produce a representative sample of the population. There is at least one sampling unit in each state, and in most states there are

1. Proposal for Collection of Data on Illness and Impairments: United States, PHS Publication 333, Department of Health, Education, and Welfare, Public Health Service, Oct., 1953.

several. Within these areas, repeated samples of households will be drawn for interviewing. Since a one-time interview is planned, subsequent samples will consist of different households each month. Also, since the size of the national sample is small—3,000 households per month—the number of households interviewed in any one area will be small.

The interview questionnaire includes questions about illnesses of all kinds and whether they are medically attended; chronic conditions and impairments whether or not they interfered with the person's usual activities; dental conditions and dental care; disability and, separately, bed disability; symptoms; accidents and injuries; and hospitalization.

The present plan is to compile periodically separate morbidity statistics for the country as a whole and for each of 11 geographical regions of the country. Data from these regions will be shown separately for large metropolitan areas as a group, all other urban areas as a group, and rural areas. In addition, statistics will be compiled separately for each of nine large standard metropolitan areas.

MENTAL ILLNESS IS A MEDICAL PROBLEM

". . . [and] it is high time the medical profession launched a concerted attack on this problem." This emphasis was made recently by David B. Allman, M.D., President-elect of the American Medical Association, at a meeting of the 1957 National Health Forum on "Better Mental Health—A Challenge to All Health Services."

"As a physician," Dr. Allman stated in his speech, "I am concerned about the responsibilities of the medical profession in treating mental patients—and more important, in preventing further increases in mental illness in the future."

Decades ago, mental illness was considered a social, moral, and legal problem, with mentally disturbed people treated as witches, possessors of evil spirits, or objects of public hilarity. Today, the conscientious, well-informed doctor, realizing that even physical illness can be mentally induced, puts more emphasis on treating the whole person to solve his mental as well as physical problems.

Dr. Allman pointed out that only about 4% of the practicing physicians in this country are psychiatrists. Great as their contributions are, these few men cannot do the job alone. What is the medical answer? It is obvious that every doctor, no matter what his specialty, must accept a greater share of responsibility for aiding in the solution of these problems.

The psychiatrist needs the intelligent cooperation of other doctors in every type of practice. Who is in a better position to deal with mental health and potential mental illness than the doctor who has maintained a close relationship with his patients over a long period of time? Unfortunately, not all who could be helpful have realized their responsibilities in this area. It has taken a long time to accept the idea that present-day psychiatry is of interest to the entire realm of medicine.

Dr. Allman listed what he believed to be the physician's responsibilities in regard to mental illness:

First, a physician must know his patients.

Second, a physician must recognize and accept the value of psychiatric techniques in dealing with all his patients.

Third, a physician must be acquainted with all the community services and resources available in treating and rehabilitating the mentally ill.

Fourth, a physician should integrate the whole treatment and rehabilitation process. He can help the patient's family understand the nature of the illness and show them how they can best help the patient during his treatment. He can act as a mediator when the patient is released and must be rehabilitated.

Fifth, a physician has a tremendous educational job to do, not only with patients and patients' families but with the general public in regard to mental illness and mental health.

Elaborating on Dr. Allman's last point, attention is directed to the fact that throughout the country, during the month of May, the National Association for Mental Health and its 500 affiliates, in cooperation with the National Institute for Mental Health, are conducting a drive to arouse public interest in the fight against mental illness. Every physician has an important role to play in these observations. As a scientist and physician he can help to educate the public with regard to mental illness. As a citizen in his community he can work with the local mental health association to help heighten public awareness so that the task of combating mental illness will not be left to the medical profession alone, but rather to all the people of the Unied States.

REGISTRATION UNDER THE HARRISON NARCOTIC ACT

Physicians who are registered under the Harrison Narcotic Act or under the Marihuana Tax Act must effect reregistration on or before July 1 to avoid penalty. Each year, despite the annual warnings in THE JOURNAL, this requirement is overlooked by some physicians, and unpleasant consequences follow. Failure to register adds a penalty of up to 25% to the tax payable and, in addition, subjects the physician who continues to dispense to the possibility of a fine not exceeding $2,000 or imprisonment for a maximum of five years, or both. The Commissioner of Internal Revenue has in past years given some tardy registrants the choice of paying sums by way of compromise, a procedure authorized by law, or accepting criminal prosecution. If this procedure does not produce the required promptness in reregistration, the commissioner will have no choice but to institute criminal prosecution.

This requirement for registration and reregistration does not apply to the physician who does not intend to prescribe or use narcotics in his practice or to possess narcotics.

ORGANIZATION SECTION

OLD-AGE AND SURVIVORS INSURANCE DISABILITY PROGRAM

The Committee on Medical Rating of Physical Impairment of the Board of Trustees has been assigned as one of its tasks the review and study of developments under the disability program administered by the Bureau of Old-Age and Survivors Insurance. The information in the following pages relating to various aspects of this program has been obtained from reviewing the present law and statements of administrative policy and procedure issued by the Bureau of Old-Age and Survivors Insurance as well as from conferences with representatives of the bureau's staff and with members of its medical advisory committee—ED.

Introduction

The primary purpose of this report by the Board of Trustees' Committee on Medical Rating of Physical Impairment is to inform the medical profession on certain aspects of the disability provisions in the Old-Age and Survivors Insurance (OASI) section of the Social Security Act. Although the American Medical Association has consistently opposed amendments to the Social Security Act leading to such a program for the disabled, the proposal is now law. Most physicians will be requested by patients from time to time to submit medical reports to the Bureau of Old-Age and Survivors Insurance (BOASI). It is, therefore, desirable for all physicians to be familiar with the information contained in this report and especially with the following points:

1. The role of the physician in this program is to assist the patient-applicant in providing the administrative agency with a written report of clinical findings and medical facts on the basis of which the administrative agency will determine whether the applicant's condition medically qualifies him as disabled under the program.

2. "Disability" is defined under this program as inability "to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or to be of long-continued and indefinite duration." From this definition it may readily be seen that "disability" is not solely a medical question.

3. Determinations of disability involve consideration of both medical and nonmedical factors. Such determinations are the sole responsibility of the administrative agency. Attending or examining physicians are not expected by law or administrative regulation to express their opinions as to whether an applicant is or is not disabled as defined in the law.

4. The BOASI establishes general policies and procedures under this program, and through its district office accepts applications and undertakes preliminary case development. State administrative agencies have considerable latitude in implementing the medical aspects of the program in accordance with locally accepted practices.

5. Misunderstandings between physicians and applicants can be avoided if physicians clearly explain their role to applicants and the scope and purpose of medical reports. The fact should be emphasized that such reports represent only one factor in the administrative agency's decision as to whether or not an applicant is eligible for benefits under the program. Applicants should be referred to BOASI district offices for information on such matters as eligibility requirements and amount of monthly benefits. The location of these offices can be ascertained from any local post office.

Program Provisions

1. *When are applicants required to submit medical evidence under the Old-Age and Survivors Insurance program?*

An applicant must furnish medical evidence when applying for:

a. Disability freeze, under which a qualified individual may protect himself and his family against loss of future benefits by having his Social Security account "frozen."

b. Disability insurance benefits, under which a qualified individual age 50 or over may receive monthly payments beginning July, 1957. The amount of the payments will be determined as though the applicant had reached 65 on the date he became disabled.

c. Disabled child's benefits, under which dependent sons or daughters of retired or deceased qualified individuals, or the mother who has in her care such disabled son or daughter, may receive monthly payments beginning January, 1957. These payments are made in cases where disability began before age 18, regardless of present age.

2. *When is an individual considered disabled under the Old-Age and Survivors Insurance disability program?*

An individual is "disabled" or "under a disability" when he is unable to engage in any substantial gainful activity by reason of any medically determinable physical or mental impairment which can be expected to result in death or to be of long-continued and indefinite duration. It should be noted that the terms "permanent and total" do not appear in the definition of disability. So while this program is popularly referred to as a "permanent and total" disability program, such reference is not an accurate one.

3. *What constitutes "substantial gainful activity"?*

Services of a substantial nature performed in competitive employment or self-employment with reasonable regularity may be considered to constitute substantial gainful activity. However, there is no specific dollar measure for determining "substantial gainful activity." Careful consideration must be given to all the facts in each case: the hours worked, the nature of the services, the continuity and duration of the period of services, etc.

4. *What is meant by a "medically determinable" impairment?*

The committee members are James R. McVay, Chairman, Kansas City, Mo.; George F. Gsell, Wichita, Kan.; Henry H. Kessler, Newark, N. J.; Quentin W. Mack, Boise, Idaho; and O. A. Sander, Milwaukee.

This means that the impairment must be one that can be determined by a physician on the basis of examinations or tests.

5. *What is meant by "long-continued and indefinite duration"?*

This means that no approximate date of recovery or improvement can be predicted with reasonable assurance.

6. *What is an "impairment"?*

An "impairment" is a physical or mental disease, anatomic abnormality or loss, or combination of these. An impairment must be so severe as to justify its consideration as the cause of failure to obtain any substantial work.

7. *When is "blindness" considered a disability?*

"Blindness" per se is considered a disability for "freeze" purposes only. "Blindness" for this purpose is defined in the law as "central visual acuity of 5/200 or less in the better eye with the use of a correcting lens. An eye in which the visual field is reduced to five degrees or less concentric contraction shall be considered for the purpose of this paragraph as having a central visual acuity of 5/200 or less." To be eligible for monthly payments even a totally blind person must establish that he is unable to engage in any substantial gainful activity. However, a person who has a less severe visual impairment may also be eligible for the freeze or monthly insurance benefits if his impairment prevents him from engaging in any substantial gainful activity.

8. *When would a claim for disability be denied in spite of a severe impairment?*

A finding of disability may not be made when an individual can do or is doing substantial work despite the impairment, as where he has special vocational skills or experience, or if the impairment is amenable to safe and acceptable treatment.

Requirements for Eligibility

9. *What requirements must an applicant meet to be eligible under the "freeze" or monthly payments provisions of the OASI disability program?*

To qualify for monthly payments, or to have his Social Security record frozen, an individual must:

a. Have Social Security credit for at least 5 years' work in the 10 years before the beginning of his disability; and

b. Have a work record in covered employment for at least 1½ years during the 3 years just before he became disabled; and

c. Have been disabled for 6 months or more at the time he files his application; and

d. Produce medical evidence that he is disabled or under a disability as defined in the law.

10. *What requirements must an applicant meet to be eligible for monthly payments under the disabled child's provision of the OASI disability program?*

To qualify for monthly payments, an individual must:

a. Have become disabled before reaching 18 years of age; and

b. Be unmarried; and

c. Be dependent upon a parent, step-parent, or adopting parent who is receiving Social Security old-age insurance benefits; or

d. Have been dependent on a parent who died after 1939 and after working long enough under Social Security to become insured for the payment of survivors' insurance benefits; and

e. Produce medical evidence that he is disabled or under a disability as defined in the law.

To receive disabled child's insurance benefits, it is not necessary for such a person himself to have any record of work under Social Security. An individual may also qualify at any age for these benefits provided he meets the requirements outlined above.

11. *If an individual is receiving payments for "total disability" under a private or another public program, will he be considered disabled under the OASI disability program?*

Not necessarily. For example, his physical or mental impairment may not be serious enough or sufficiently prolonged to meet the definition of disability under this program. Furthermore, he will not necessarily be considered disabled because he can no longer do the type of work required in his last job or any jobs he has held in the past, a characteristic frequently entitling an individual to benefits for "total disability" under some other programs.

12. *Under what circumstances other than cessation of disability may monthly payments, under the OASI disability program, be reduced, suspended, or delayed?*

Monthly payments will be reduced by the amount of any other cash benefits the disabled individual receives under a disability program of another federal agency except veterans' compensation based on service-connected disabilty, or under a state or federal workmen's compensation law. Monthly payments may be suspended if the individual refuses without good cause to accept rehabilitation services available to him under a state plan approved under the Vocational Rehabilitation Act. Policies and procedures in determining what constitutes "good cause" are being worked out by BOASI and state vocational rehabilitation agencies. The actual determinations in specific cases will be made by BOASI. Monthly payments are not payable for the first six months of disability, even though the individual may already be 50 years of age or older at the time his disability begins.

Administration

13. *What agency administers the Old-Age and Survivors Insurance disability program?*

The responsible administrative agency is the Bureau of Old-Age and Survivors Insurance (BOASI) in the Department of Health, Education, and Welfare. However, under an agreement between each state and the Secretary of the department, an agency in each state makes determinations of disability. State agencies are reimbursed from federal funds for all necessary expenses. In those cases not covered by state agreements the determinations of disability are made by BOASI.

14. *What State agencies are designated to make determinations of disability?*

In 43 states the designated agency is the state vocational rehabilitation agency. In New York, North Carolina, Washington, Oklahoma, and South Dakota, determinations of disability are made by the state public welfare agencies. In 10 states, arrangements have been made for special agencies to make determinations where the principal impairment is visual. Each state

agency is expected to develop its own relationships with the medical profession in reference to medical consultants, medical advisory committees, consultative examinations, and other medical matters.

15. *What medical aspects of the disability program are responsibilities of a state agency?*

A state agency's responsibilities include:

a. Evaluating the adequacy of medical evidence submitted by an applicant;

b. Obtaining clarification of or additional medical evidence from the applicant or other sources;

c. Authorizing and obtaining additional medical examination of the applicant, where necessary to verify medical evidence obtained by the applicant;

d. Determining through the application of prescribed medical criteria whether the applicant is or is not under a disability;

e. Recommending follow-up medical examinations, where indicated;

f. Reconsidering disability determinations where requested by BOASI;

g. Fostering mutual understanding with physicians in connection with administration of the program;

h. Providing sufficient qualified personnel to evaluate pertinent medical data and other evidence, and to make determinations of disability in all cases covered by the agency's agreement with the department.

16. *What administrative phases of the disability program are not responsibilities of the state agency?*

The State agency is not responsible for:

a. Determining whether the applicant has met the requirements of the law other than that he is or is not under a disability;

b. Notifying the applicant of the determination in his case;

c. Explaining the program to applicants;

d. Conducting hearings on appeals from or defending agency determinations of disability.

17. *What aspects of the disability program are responsibilities of a BOASI district office located in a state?*

The BOASI district office is responsible for:

a. Explaining the program to applicants and the public;

b. Advising applicants regarding potential eligibility;

c. Providing applications and other required forms;

d. Assisting applicants in completing applications and obtaining necessary data from a physician, hospital, or other source;

e. Accepting applications and requests for reconsideration or hearing;

f. Forwarding case files for determination of disability to the appropriate state agency.

18. *What administrative phases of the disability program are not responsiblities of the BOASI district office?*

The BOASI district office is not responsible for:

a. Making determinations of disability;

b. Advising an applicant regarding the nature of his disability.

19. *How do applicants file an application under the OASI disability program?*

Applicants may obtain and file the necessary forms and information at their local BOASI district office. It is desirable for them to visit the office in person. However, if they are unable to appear personally, they may write or telephone or have someone else do so for them. The location of the appropriate office may be obtained from their local post office. There are more than 550 such district offices.

20. *What are "determinations of disability"?*

"Determinations of disability" are the decisions that an applicant is or is not disabled, including the date of onset or cessation of disability.

21. *How and by whom are determinations of disability made in a state agency?*

Determinations of disability are made by "review teams" in a state agency. Each review team is composed of a disability examiner and a review physician.

The reviewing physician (often a practicing physician) is responsible primarily for evaluating the applicant's medical evidence and assessing the severity of the impairment, or combination of impairments. The disability examiner is the nonmedical member professionally qualified to assess the work history, occupational capacity, and other factors in the evaluation of a disabled individual's ability or inability to engage in substantial gainful activity.

The determination of disability is the end-product of the application of these professional skills to the facts of each specific case and the assessment of the degree of physical or mental impairment along with the individual factors of age, education, training, and employment experience. All determinations of disability are made jointly and are signed by both members of the review team.

In a few large state agencies, the reviewing physicians may be supervised by a medical consultant, although in other state agencies the medical consultant is also the reviewing physician. A medical consultant's primary responsibility is to advise the state agency on broad policies relating to medical aspects of the program, recommending acceptable standards and procedures, and establishing liaison with medical and related professional groups. Some state agencies have district medical consultants in addition to a state medical consultant. A state agency may have more than one medical consultant.

22. *Does the local medical profession participate in the selection of medical personnel and the development of medical policies and practices of the state agency in connection with the OASI disability program?*

The degree of participation by the medical profession depends upon the relationship between the state agency and the medical group. The state agency is primarily responsible for the development and maintenance of a satisfactory relationship with the medical profession at the state level.

23. *After the review team makes a determination of disability what happens?*

The file and recommendation of the state review team is sent to the division of disability operations, BOASI, in Baltimore, for review by medical and adjudicative personnel. The BOASI may reverse the finding of a state review team that an applicant is disabled. The BOASI may not, however, reverse a state finding that the applicant is not disabled. However, in the latter case, the file may be returned to the state agency for reconsideration, after which the state agency may

affirm or reverse its original recommendation. This does not mean that the state agency must reverse its decision, even when referred back for reconsideration the state agency can affirm or reverse its original recommendation as it sees fit.

24. *How is the applicant notified of the decision on his claim?*

He receives a letter from BOASI. When a claim is disallowed on the basis of medical evidence, no reference is made to the specific content of the medical reports contained in the file.

25. *Can an applicant appeal from the decision of BOASI?*

Yes. He may file a request with the BOASI district office for reconsideration or a hearing before a referee of the Social Security Administration. Appeals from a decision by a referee may be taken to the U. S. District Court.

26. *When and by whom are individuals referred for vocational rehabilitation services?*

Generally, the same review team which makes the determination of disability also decides whether the applicant should be considered for vocational rehabilitation services. The names of any such individuals and any information in the file is used by the rehabilitation agency in its investigation and consideration of eligibilty for rehabilitation services.

27. *Does BOASI have any control over vocational rehabilitation standards of eligibility established or services furnished by a state vocational rehabilitation agency involving applicants for disability benefits?*

No, these aspects are entirely in the hands of the state vocational rehabilitation agencies.

28. *What follow-up is made in reference to rehabilitation?*

None by BOASI; the state vocational rehabilitation agency handles the case as it sees fit, reporting to BOASI when disposition of the case is made.

29. *Do monthly payments under the disability program continue during the rehabilitation period?*

Yes. Moreover, he may continue to receive benefits for as long as a year even though working, if his work is pursuant to a state plan approved under the Vocational Rehabilitation Act.

Medical Evidence

30. *How are BOASI medical policies and practices established?*

BOASI medical policies and practices are established by consultation between its medical and lay administrators and its medical advisory committee. These medical considerations serve as general guides for the state agencies when affecting determinations of disability.

31. *What is the medical advisory committee and when was it appointed?*

In February, 1955, the commissioner of Social Security appointed a committee, representative of a wide variety of skills in medical practice and public and private medical and welfare administration and of the major geographical areas of the country, to advise him on medical policies involved in administering the disability freeze provision of the Social Security Act. Subsequently the committee's duties were enlarged to include all provisions of the OASI disability program. Since its appointment in 1955 the committee has met six times.

32. *What are the purposes of the medical advisory committee?*

The purposes of the medical advisory committee are:

a. To provide technical advice and consultation regarding medical aspects of the administration of the disability program.

b. To promote mutual understanding and effective working relationships among the Social Security Administration, cooperating state agencies, and physicians generally.

c. To provide professional guidance in formulating medical guides and standards for evaluating disability.

33. *What medical criteria are used by state and federal review teams in evaluating specific impairments and combinations of impairments?*

The Department of Health, Education, and Welfare has prepared guides for the review teams in federal and state agencies. The guides contain descriptions of more than 130 commoner types of conditions that usually result in total disability. They contain clinical descriptions of these conditions in terms of anatomic damage and functional loss that demonstrate great severity. The advice and assistance of staff physicians of the U. S. Public Health Service and consultation and assistance of the medical advisory committee were obtained in establishing these guides. They are constantly under examination in the light of experience to insure that they are realistic and reflect advances in medical knowledge. These guides have been helpful in identifying cases of clear-cut disability and in describing the clinical evidence necessary to establish the existence and severity of these conditions.

34. *Are copies of these criteria available to physicians?*

No. At the present time they are not available. In themselves the guides are not wholly representative of all the considerations taken into account in making a determination of disability. They do not contain transmittals issued subsequent to the preparation of the guides, understandings resulting from individual case discussions, etc. Neither do the guides fully represent the weight given to nonmedical factors in adjudication. Regulations are being developed which will indicate to the public the basic criteria for eligibility.

35. *What medical proof of disability is the applicant required by law to furnish?*

The pertinent provision of the law states: "An individual shall not be considered to be under a disability unless he furnishes such proof of the existence thereof as may be required." The applicant is required to obtain, at his own expense, sufficient medical evidence from which a determination in his case may reasonably be made by the review team. Individual medical examinations, records, and other data that the applicant needs to prove his disability may not be paid for from OASI funds.

36. *How do applicants obtain the required medical evidence to support their applications?*

In general applicants will ask a physician to complete a medical report form and mail it to the BOASI district office. Other sources may be hospitals, institutions, places of employment, or public or private agen-

cies, where applicants have been treated for their disabling conditions. Applicants may be requested to obtain medical evidence either by BOASI or by the state agency.

37. *What assistance do BOASI district offices provide an applicant?*

A primary function of a BOASI district office is to advise applicants of their rights and assist them to obtain the necessary evidence. The term "case development" refers to this function of the BOASI district office. "Development" does not imply that BOASI funds have been used to purchase medical evidence. When applicants are interviewed, either at a district office, an itinerant station, or their homes, possible sources of medical evidence are discussed in order to determine the source from which the most comprehensive data on the applicant's condition may be obtained. Applicants may also be assisted in completing a request for a medical report. Where special circumstances indicate, a district office may arrange directly with the source to present a report for the applicant. Occasionally a BOASI district office will help the applicant by copying the medical record or summary in possession of a hospital.

When the BOASI district office knows a physician's preference (personal visit by applicant or report form mailed) in the matter, the district office may suggest that the applicant follow the physician's preference. When advisable, the district office may also telephone a physician to request a report on behalf of the applicant.

38. *When may an applicant be required by a BOASI district office to obtain additional evidence?*

BOASI District Offices may require the applicants to furnish additional medical evidence when a report is grossly inadequate, as when:

a. Evidence submitted deals with a condition other than the alleged disability; or

b. In old disability cases, the report does not contain any information as to onset; or

c. The medical report contains only a one or two word diagnosis; or

d. When additional evidence is needed which can be best secured by the district office through the applicant.

39. *Are applicants requested by the BOASI district office to obtain medical evidence of disability although there may be some question as to whether he meets the work requirements?*

Yes. For example, medical evidence is required and the case referred for a determination even though the applicant does not have a record of at least 1½ years of work in covered employment in the 3 years just before the date on which the applicant alleges his disability began. Ordinarily such an applicant would not be considered eligible. However, consideration of all evidence in the file may lead the review team to decide that the date on which the applicant alleges his disability began is incorrect and the applicant is, therefore, eligible.

40. *To whom does the term "reporting physician" refer?*

A reporting physician is the doctor who submits a medical report on the applicant's disability. He is usually the applicant's attending physician but sometimes where the disability is of long standing he may be a doctor who is not now treating the applicant but who has done so in the past.

41. *What is an applicant's principal source of medical evidence?*

An applicant sufficiently disabled to qualify under this program will probably be receiving medical care, or have had a medical examination for his condition. Ordinarily, a written report by the reporting physician based upon his existing records or a current examination of the patient will be sufficient.

42. *What information should a medical report contain?*

A medical report should be a concise, factual statement of clinical findings and medical facts by which the state agency's review physician or medical consultant can confirm such findings and arrive at a sound conclusion as to the severity of the impairment, thereby determining whether the applicant meets the medical qualifications for disability. The pertinent history, symptomatology, clinical findings, and diagnosis should be reported in sufficient detail to permit another physician to establish, from the report, the degree of severity of the applicant's impairment. Reporting physicians are not asked to express opinions as to whether or not the applicant is disabled in terms of either the degree of severity of the impairment, or work capacity, or employment potential of the applicant. These determinations are the responsibility of the review team, not the reporting physician.

43. *Is the use of official medical report forms mandatory?*

No. A basic form is provided. However, physicians may use any other form or prepare a narrative statement, incorporating the necessary information, on their personal letterheads.

44. *To whom are medical reports submitted?*

Physicians should mail medical reports to the requesting office (BOASI or state agency). The return address will be furnished with the request.

45. *Under what circumstances may a reporting physician be asked to supplement or clarify one of his reports?*

When a report fails to provide sufficient information to establish the severity of impairment, the review physician or medical consultant may write or call the reporting physician for additional data. Occasionally the patient himself will receive official notice that additional medical evidence is necessary.

46. *If the reporting physician cannot supply the supplementary data requested from his existing records, what procedure should be followed?*

If such data cannot be supplied without further examination of the applicant, the physician should so inform the applicant and discuss with him the necessary procedures and costs for developing the required data.

47. *What happens when an applicant fails to furnish additional medical evidence or to submit to a medical examination as requested by the state agency?*

Thirty days after the last request for additional evidence is made by the state agency, a determination will be made on the evidence in the file and the file sent to the division of disability operations, Bureau of Old-Age and Survivors Insurance, Baltimore. If an

applicant fails to submit to an examination, he is allowed to explain his failure and a decision is made on all the facts in the case.

48. *To whom is medical evidence available which has been provided by the applicant?*

Generally, medical information cannot be disclosed to anyone without the consent of both the applicant and the source. However, medical evidence is routinely made available to state vocational rehabilitation agencies for rehabilitation purposes.

49. *Is there a specific provision in the law under which BOASI or a state agency may authorize the payment of OASI funds for medical examination or records required of an applicant to initiate and support his claim under the OASI disability program?*

No. The basic responsibility for initiating and supporting his claims rests on the applicant.

50. *By what authority does BOASI or a state agency expend OASI funds for medical examinations or records?*

Authorization for medical consultation is derived from the statutory authority granted the Secretary (1) to adopt reasonable rules and regulations to provide for the nature and extent of proofs and evidence, and the methods of taking and furnishing the same to establish benefit rights; and (2) to hold such hearings and conduct such investigations and other procedures as he may deem necessary and proper for the administration of the act.

Similar statutory provisions have for many years been construed to authorize the use of government funds for the purchase of evidence, including medical evidence.

51. *Under what circumstances may OASI funds be expended for medical examinations?*

OASI funds may be expended for medical examinations when the applicant has submitted sufficient evidence to show there is a reasonable likelihood that the impairment meets the disability requirements and yet there is still some question whether a sound decision can be made. In such case, a medical (consultative) examination, at government expense, may be authorized by the state or federal review physician in order to insure that an improper award will not be made.

52. *What is the purpose of a consultative examination?*

Consultative examinations are authorized for the purpose of

a. Verifying the medical proof of disability that an applicant has submitted; or

b. Providing additional medical details needed to confirm the diagnosis or establish the severity of the applicant's present condition, including measurement of the extent of his remaining functional capacities or the potential remediability of the condition.

53. *Who determines the type and scope of a consultative examination?*

The state review physician makes these decisions in light of the particular circumstances of the case. A consultative examination may vary from a simple laboratory test to a complete medical examination, including work evaluation and complete diagnostic services.

54. *By whom are consultative examinations performed?*

These examinations are performed by consulting physicians selected by the state review physician. The degree of participation by the applicant's physician in the referral of his patient to a consulting physician depends upon the policy of the state agency. In selecting consulting physicians, the review physician is expected to conform to the customary practice of the state agency or follow the procedures he believes most suitable to the local conditions consistent with the maintenance of good doctor-patient relationship.

55. *What medical information from the applicant's file is made available to a consulting physician?*

Any information necessary to an effective examination can be furnished to the consulting physician.

56. *What expenses other than professional fees are payable from OASI funds in connection with consultative examination?*

When the physical condition of the applicant warrants, transportation costs and other directly related and necessary expenses may be paid. Travel expenses of the consulting physician may also be paid when the applicant is unable to come to the physician's office. Hospitalization of the applicant for observation and tests, but not for treatment, may also be provided. Any expenditure must be authorized in advance by the state agency.

57. *To whom is medical evidence available which has been obtained at government expense?*

Such information may be made available to the applicant's attending physician upon the request of the applicant and the consent of the consulting physician.

58. *Is it an administrative policy at the federal or state level that the consulting physician be mutually acceptable to both the applicant's attending or examining physician and the review physician?*

No. The basic policies are (1) noninterference in doctor-patient relationships and (2) conformance to existing state agency practices and procedures consistent with local conditions. State agency practices vary. Many of them consider acceptability to attending physician when selecting a consulting physician.

59. *Are there any statutory provisions which prevent either the federal or state agency from adopting such a policy?*

No.

60. *Can the federal or state agency pay the applicant's attending or examining physician for professional services in developing additional medical details needed to confirm the diagnosis or to establish the severity of impairment, after the applicant has submitted, at his own expense, sufficient evidence to show there is a reasonable likelihood that the impairment meets the disability requirements?*

Yes. The state agency has the responsibility for deciding what evidence is needed and the best source of the evidence. There is no prohibition on the use of the attending physician in a consultative capacity; however, in many cases, an examination by an independent medical source is considered preferable by the state agency.

VA MEDICAL CARE PROGRAM

In the Oct. 27, 1956, issue, THE JOURNAL *printed the text of an address presented by Louis M. Orr, M.D., Chairman of the Committee on Federal Medical Services of the Council on Medical Service, entitled "To Socialized Medicine and Socialism by Way of the Veterans Administration." This address has since been published in pamphlet form under the title "The Trojan Horse" and may be obtained from the Public Relations Department of the A. M. A.*

THE JOURNAL *has received a letter from Robert A. Bell, M.D., medical consultant, National Rehabilitation Service, Veterans of Foreign Wars of the United States, disagreeing with both the policy and the philosophy of Dr. Orr's statement and with certain statistical material quoted in the address.*

Since Dr. Bell takes issue with policies of the American Medical Association referred to the Committee on Federal Medical Services for action, his letter was forwarded to that committee for comment. Dr. Bell's letter and a reply prepared by Dr. Orr follow.—ED.

To the Editor:—This pertains to a manuscript which was presented before the annual meeting of the Louisiana State Medical Association, April, 1956, by Louis M. Orr, M.D., and reprinted in THE JOURNAL (**162**:860-865 [Oct. 27] 1956). The theme of that manuscript appears to have been impending socialized medicine and socialism through federally financed and controlled medical care of veterans with non-service-connected disability, in the VA hospital and medical system.

I would not take issue with the right of any individual to express his viewpoint on the question under consideration but do plead for clarity, facts, and avoidance of bias in discussion of the problem. Dr. Orr was correct in stating that the American people must decide what is to be the future course of the VA hospital and medical care program, but there is reason to question the correctness of his implications that such decision has not and is not being made, that it must be made soon or it will be too late, and that if the program is not reversed we will eventually reach socialized medicine by default.

The hospitalization of veterans for non-service-connected disability is effected in accordance with public policy. The governing statutes are enacted by the elected representatives in the Congress and approved by the President. Those who enact these laws are elected by qualified voters. We can only assume that the present program represents the consensus of current public opinion. The public, however, has not permitted or authorized an unrestricted hospitalization program.

The basic eligibility for treatment in VA hospitals for non-service-connected disabilities is now limited to some veterans of wartime service. Veterans of peacetime service must have been discharged from military service for disability incurred in service or must be in receipt of compensation for service-connected disability. Further, in the case of a veteran who has basic eligibility for wartime service, but was not discharged for disability and has no service-connected condition, there is the added requirement of a statement, under oath, of inability to pay the prospective cost of such treatment.

The war veteran (one who has had at least 90 days of continuous service, some of which was during a war period, from which he received a discharge other than under dishonorable conditions) who was not discharged from military service for disability and who has no disability adjudged by the VA to have been incurred in service or aggravated thereby, has no eligibility unless he certifies under oath that he is unable to pay for his prospective hospitalization and then, on a bed available basis. To state these eligibility requirements in another way, a veteran is not eligible for VA hospitalization for non-service-connected disability merely because he is a veteran. The peacetime veteran has no eligibility unless he either was discharged from the armed forces for disability incurred or aggravated in service or is in receipt of compensation for such disability. The war veteran who was not discharged from military service for disability incurred in service, or aggravated thereby, and is not in receipt of compensation, has no eligibility unless he served more than 90 days, had a discharge other than dishonorable, and certifies under oath that he is unable to pay for his prospective hospitalization—and then, on a bed available basis, and subject to medical determination of need for such medical care.

It would seem that VA hospitalization for non-service-connected disability constitutes a public assistance program only for those disabled as a result of service, and for those war veterans who cannot afford, at the moment, the prospective cost of their hospitalization. This program hardly seems to have drifted from its original humanitarian purpose. It is a part of the over-all pattern of benefits, including compensation, pension, and readjustment aids, largely for war veterans, which has been established for the assistance and relief of eligible veterans as a measure of the government's obligation and therefore at the expense of the government. This program was instituted in 1924 by President Coolidge—an individual who would hardly be accused of having favored socialistic measures. In fact, the original program was far more liberal than is the restricted program currently in effect. The act of June 7, 1924 [Sub-Section 202 (10), Title II, Public, No. 242, 68th Congress] authorized, within the limits of existing government facilities, hospitalization for veterans of any war, military occupation, or military expedition since 1897, not dishonorably discharged, without regard to the nature or origin of their disabilities. The basic policy presently in effect was drafted into law (Section 6, Public, No. 2, 73rd Congress, approved March 20, 1933) in the depth of an unprecedented depression and it has not been changed materially since that time.

The hospitalization of a veteran for non-service-connected disability is contingent upon the availability of beds, and this is governed by, among other things, hospitals in being and by appropriated funds. The latter factor is reviewed periodically by the executive and the legislative branches of the government. Since 1948, when the Federal Board of Hospitalization was

abolished, the Bureau of the Budget has consistently reviewed and coordinated the hospital, convalescent, and domiciliary programs developed and operated by the departments and agencies of the federal government. Therefore, it is hardly correct to contend that the program has not been mandated by the American people.

It should be apparent from the foregoing that the total number of veterans is not synonymous with the number of veterans eligible for hospitalization in the VA hospitalization program and that even war veterans are not unconditionally eligible for such care. It should further be recognized that a high percentage of war veterans, because of income status and the "inability to pay" oath requirement, will be unable to obtain these hospitalization benefits.

As of Nov. 30, 1954, the VA hospital patient load included 53.5% who were receiving treatment for non-service-connected disabilities. These patients, in addition to meeting other requirements, had signed an affidavit of inability to defray the cost of hospitalization. Of this group, a number equal to 32.8% of the entire patient load was comprised of patients under treatment for "chronic" disabilities, such as tuberculosis, psychosis, or other conditions which had kept them in a hospital for at least 90 days. The remaining 20.7% of the entire patient load was being treated for non-service-connected disability which was categorized as "nonchronic," and almost half of these (9.4% of all VA patients) were in receipt of or had formally applied for a VA pension for non-service-connected disability. To receive, or be eligible for, such pension carries a double connotation of medical indigency: 1. The veteran must have a condition which is permanently and totally disabling and which interferes with the earning of a livelihood. 2. The veteran cannot have an income of more than $1,400 if single, or in excess of $2,700 if with dependents. More than one-half of this group of veterans were hospitalized for cardiovascular disease, cancer, neurological disease, or arthritis; and it appeared likely that the majority would require prolonged or repeated hospitalization. Another 1.2% of the total VA patient load had filed claims for a service-connected disability. This left 10.1% of the total hospital load who were being treated for a non-service-connected condition and who were under treatment for less than 90 days. The VA experience indicates that about one-fifth of them would actually be patients who presented "chronic" illness. The chronic nature of the VA patient load was reflected in some measure by the fact that 64.6% of the patients in VA hospitals on Nov. 30, 1954, had already been on the hospital rolls more than 90 days, and 49% had been hospitalized for more than one year. It is also significant to note that the President's Commission on Veterans Pensions found (April, 1956) that almost 30% of the present pensioners have no income other than their veteran's pension and that less than 2% have incomes which come close to the present annual income limitations of $1,400 and $2,700.

In light of the foregoing, one might reasonably question the intent and perspective reflected in the A. M. A. official policy statement, quoted in the manuscript in question, regarding "whether the federal government should continue to engage in a gigantic medical care program in competition with private medical institutions"; and the further statement, "whether the ever increasing cost of such a program is a proper burden to impose on the taxpayers of the country"; and the further statement that "preferential treatment for veterans with these non-service-connected disabilities cannot be continued indefinitely, in view of its detrimental effect on the health and the economy of the entire nation."

The "competition" is hardly financial where the patient cannot afford the care; and, if the hospital care is conceded to be a necessity—and no one seems to contend otherwise—then funds must be forthcoming from either charitable, local, or federal sources; and, it is difficult to perceive how this program can be detrimental to the health of the nation; and, certainly the program requires a smaller percentage of the total national income than was the case 20 and 30 years ago.

Aside from these considerations, the basic law provides that the statement under oath of the applicant who is otherwise eligible shall be accepted as evidence of inability to defray necessary expenses of hospitalization. The General Accounting Office has investigated the application in practice of this "inability to pay" statement, and its first report, dated March 11, 1953, was interpreted as indicating a possible abuse of the "unable to pay" hospitalization entitlement. The VA then issued, on Nov. 4, 1953, Circular 11 placing in effect an addendum to VA form 10-P-10, requiring veterans to answer, when executing affidavits of inability to pay, questions about income and net worth. The purpose of this addendum was to focus the veteran's attention upon the propriety of his making an affidavit of inability to pay.

The General Accounting Office, in February, 1956, submitted a further report, in response to a request from the House Committee on Veterans Affairs, on the financial status of veterans hospitalized for non-service-connected disabilities. This report covered an investigation of 25,500 persons hospitalized for non-service-connected disability in general medical and surgical hospitals, and indicated that 217 of these persons had annual incomes of $3,500 or more (of which 186 had dependents, 44 were hospitalized for more than 30 days, and 87 carried medical insurance coverage). Chairman Olin Teague of the House Veterans Affairs Committee noted the alleged abuse of the VA hospital program by a small percentage of veterans who falsely state inability to pay for hospitalization, and the Veterans of Foreign Wars has approved efforts to correct such abuses.

The VA hospitalization program is intended for the care of those with service-connected disabilities and for war veterans with non-service-connected disabilities who are unable to pay for such care. The modernization of this program and its development as we know it today have come about only in connection with and as an outgrowth of the development of great hospital centers in our contemporary society. This has followed the advances in medical knowledge and the pattern of extension of general benefits to all of the

population over the years. Other than these considerations, the VA hospital program has not changed materially in 30 years. In fact, it has become more difficult to obtain hospitalization for non-service-connected disability because of tautened administrative practices and because the proportion of beds to eligible veteran population has greatly decreased.

The factor that has changed is the large increase in number of war veterans due to three great wars within the span of almost one generation. Nevertheless, the numbers of veterans who can qualify for VA hospitalization benefits has not increased proportionally because of the limitations on income eligibility and the over-all increase in per capita income in this country. It is difficult to perceive of how anyone can read into this program a trend to socialism. It is in fact nothing more than an extension to the federal level of benefits for a group to whom the nation as a whole owes a debt, on a basis not materially different from that accorded at the state or local level, to citizens who qualify under laws of compensation or need. In compensation cases, it is, at the federal level, analogous to the hospitals of private industry, of the individual states, and of the municipalities where used for similar purpose; and, in non-service-connected cases, it is analogous to the use of hospitals of states, municipalities, and charitable institutions for those unable to pay for services received.

To my knowledge no major veterans' organization has ever recommended that VA hospitalization benefits be extended to dependents of veterans, to farmers, to industrial workers, or any groups other than veterans of war in need, or veterans with service-connected disabilities. No major veterans' organization has ever supported socialism in any form, and these organizations have, on the contrary, been opposed to it. The Veterans of Foreign Wars at its 57th National Encampment at Dallas, Texas, Aug. 12-17, 1956, resolved, that "we resist without compromise all socialistic schemes at home."

It would appear that in our society as we know it today there is no question but that citizens in need thereof should be accorded hospital benefits, at the expense of others where required. The proper general approach to making such benefits available to all citizens without cost to others is to promote those measures which provide an adequate income for all persons. Great progress has been made in this direction in recent decades. Until this goal is reached, however, there will be needy individuals who will require public assistance in their hour of need. The federal government, for reasons which need not be elaborated here, but which surely have not been intended to lead to socialism, is engaged heavily in according such assistance to all citizens, as in the federal support for local hospital construction, for medical school support, for residency training of physicians, for public health service programs, and for medical research, to mention a few.

There are good reasons why needy war veterans should continue to look to the federal government for non-service-connected hospitalization benefits. These men have served their fellow men in time of war above and beyond the ordinary call of citizenship. They have given of their health, their resources, and their time when other citizens have not so served; and economic resources have never been drafted. The war veterans have offered their maximum gift at a time when the country was endangered, and under this program they are only being accorded limited health benefits in their hour of individual need. This is in accord with the traditional American concept, dating back to the days of the Pilgrim Fathers, that those who have rendered special service to their country are entitled to special consideration. The citizens who served in World War II and the Korean war did so with the understanding that the type of limited hospital benefit in question constituted a part of the over-all pattern of benefits which were established for the aid and relief of eligible veterans as a measure of the government's obligation and therefore at the public expense.

Finally, it perhaps is not amiss to consider the moral and psychological implications for the future of any severe curtailment or restriction of this program. In these days of tremendous social unrest, when great efforts are being expended to influence men's minds and win their allegiance, it would seem the height of folly to endanger a restricted but humane policy and program which so fully expresses the goodness, the humanity, and the moral leadership of this great country. If we are to expect our citizens of the future to give of their lives, if necessary, to protect that which we hold dear, then we must leave them a heritage of fairness, humanity, and recognition for special service unstintingly rendered.

ROBERT A. BELL, M.D.
Medical Consultant
Veterans of Foreign Wars
610 Wire Bldg.
Washington 5, D. C.

ANSWER TO LETTER FROM ROBERT A. BELL, M.D., VETERANS OF FOREIGN WARS

Basically, Dr. Bell argues (1) that the present Veterans Administration hospitalization program has a mandate from the people; (2) that this program is still fulfilling its original purpose; (3) that eligibility of veterans for non-service-connected care is strictly limited by law and VA regulations; (4) that the VA's non-service-connected load is primarily chronic in nature and therefore a legitimate federal responsibility; (5) that the VA hospital system does not compete with private medical institutions; (6) that the care of veterans with non-service-connected disabilities is a legitimate federal duty; (7) that the VA hospitalization program cannot justifiably be charged with tending toward or indicating a trend toward socialism.

In each of these points, Dr. Bell is in disagreement with the statements in the address; each will be considered individually below:

1. *Popular Mandate.*—Dr. Bell's argument that the present program has a popular mandate appears to be based solely on the fact that it is legal. Congress passed the enabling acts and has, year after year, appropriated money for the program; the Bureau of the

Budget reviews the program consistently; these agencies are the agents of the people—therefore, "the present program represents the consensus of current public opinion."

Answer: A program does not have "public support" merely because it lacks concerted public opposition. That continued existence of a federal program proves popular consent is an essentially naïve position. With the vast amount of legislation considered by Congress each year, the average citizen becomes aware only of those programs given intensive national publicity. But, as stated, "the facts and philosophy behind the VA program have never been brought clearly to the attention of the American people."

The President's Commission on Veterans' Pensions (Bradley commission) spent a full year in intensive study of nonmedical veterans' benefits and concluded:

"Our present structure of veterans' programs is not a 'system.' It is an accretion of laws based largely on precedents built up over 150 years of piecemeal development. The public at large has taken little interest and the laws have been enacted in response to minority pressure. . . . There is, at present, no clear national philosophy of veterans' benefits."

2. *Original Purpose.*—Dr. Bell believes the VA has not wavered from the original purpose of the veterans' hospitalization program; the program "is intended for the care of those with service-connected disabilities and for war veterans with non-service-connected disabilities who are unable to pay for such care." In evidence, he gives the legislative history of veterans' care, beginning with the World War Veterans Act of 1924.

Answer: In 1917, when medical care for veterans at federal expense was first authorized, it was for service-connected disabilities only. In 1923, due to the large number of vacant beds in federal hospitals, non-service-connected neuropsychiatric and tuberculosis care was authorized for veterans of the Spanish-American War, the Phillipine Insurrection, and the Boxer Rebellion. In 1924, non-service-connected care was authorized for veterans of any war since 1897, regardless of ability to pay—still because of empty beds. (This is the point at which Dr. Bell's historical note begins.)

In 1926, the 1897 limitation was eliminated, but, in 1933, non-service-connected care was limited to veterans with tuberculosis, neuropsychiatric cases, or permanent disabilities. In 1934, the present eligibility standards were established, under which the main limitations are available facilities and the veteran's inability to pay.

These six legislative steps, from 1917 on, were itemized in the talk; they are repeated to show that veterans' hospitalization was originally provided for service-connected ailments only. Non-service-connected care was added later, not as a basic purpose of the program, but as a supplementary benefit, intended primarily to utilize vacant beds.

In 1949, Col. George Ijams stated in testimony before a Senate committee that President Coolidge only approved treatment of non-service-connected cases by the (then) Veterans' Bureau hospitals when persuaded it would be cheaper than treating them outside the federal hospital system. In July, 1953, Mrs. Edith Nourse Rogers, Chairman of the House Committee on Veterans Affairs, presented at a subcommittee hearing a history of non-service-connected care which indicated that President Coolidge's primary interests in veterans' care were (1) treatment of service-connected cases and (2) utilization of the 9,500 federal beds vacant in 1924.

The Veterans Administration itself appears to be uncertain as to the program's present purpose. Early in 1957, Administrator Harvey Higley, testifying before the House Committee on Veterans Affairs, asked Congress whether new beds should be built for service-connected treatment only and what the VA policy should be regarding new construction for non-service-connected care—questions which are certainly not justified by the law itself.

The history of veterans' hospitalization makes clear that the original purpose was to provide care for service-connected disabilities. Care for non-service-connected ailments is one of the Bradley commission's "accretions," a byproduct resulting from the desire not to let beds go empty. But, if the public is not informed as to the true facts, past construction for non-service-connected needs will become a precedent for future construction, and the program may expand on an "open-end" basis, with no limit in sight except the total number of veterans in the population.

3. *Limitations on Eligibility.*—Dr. Bell disputes the statement (1955 Hoover commission report) that the Veterans Administration medical care program has a potential of 21 million beneficiaries; the limitations on non-service-connected care make this figure an exaggeration (no alternate estimate offered).

Answer: Five factors affect the provision of non-service-connected care. The applicant must have a condition requiring hospitalization, wartime service (not 90 days minimum, as Dr. Bell states, but any wartime service), and a discharge other than dishonorable; he must be unable to defray medical and/or hospital expenses, and there must be a bed available in some VA facility, not necessarily in his state of residence (in 1954, 15% of VA patients discharged were hospitalized outside their own states).

Veterans may possibly be prevented by the first limitation from obtaining VA care for some minor ailments, but it does not limit the potential number of beneficiaries; any veteran can, at some time in the future, contract a hospitalizable illness. At the beginning of this year, over 22,500,000 of the nation's 22,600,000 veterans had wartime service. We do not have figures on the total number of veterans with dishonorable discharges, but less than 1.5% of the nearly 200,000 pension and compensation applicants in 1955 were rejected for this reason. It seems obvious that these three "limitations" do not significantly reduce the potential patient load.

Bed availability limits the amount of care which can be provided, not the number of veterans eligible for care—and the number of VA beds has been constantly expanding. In 1940, there were almost 60,000 operating VA beds; in 1955, there were twice as many operating

beds and 127,605 constructed beds. Yet, according to the VA's own census (Nov. 30, 1954), only 42,456 VA patients were then being treated for service-connected disabilities—less than the total beds 17 years ago. Since 1940, the VA has made 60,000 new beds "available" for non-service-connected care.

Obviously, when the number of eligible veterans increased, the number of VA beds followed suit, especially since our laws set no limit on VA hospital expansion. In 1957 (as previously noted) the VA brought before Congress the question of further expansion.

Ability to pay, therefore, becomes the significant factor in deciding the potential patient load. But here the VA is not allowed, by its interpretation of the law, to determine eligibility; the veteran is his own judge. Dr. Bell says "a high percentage of war veterans, because of income status and the 'inability to pay' oath requirement will be unable to obtain these hospitalization benefits." Income status is no barrier to entitlement, since there is no income level or, indeed, any objective standard by which it can be decided whether a veteran is able to pay. The VA itself says that even the statement of assets and liabilities "may be used in no way whatever to deny hospitalization to a veteran." The statement of inability to pay is considered sufficient, and even overriding, evidence by the VA.

How much meaning can this oath have, even to the honest veteran? The majority of patients sign it when applying for care—before diagnosis and treatment and before knowing how long they will be hospitalized. They have no idea how much care will be needed, and certainly no idea of its cost or that of comparable private treatment. A veteran in the middle-income group, with a family dependent on him, might (without any conscious dishonesty) decide he could not afford to pay for care which a non-veteran in similar circumstances would scrimp and save for or provide through voluntary health insurance—merely because the veteran has been convinced by years of speechmaking that he has "earned" lifetime special care.

However you look at it, the "inability to pay" statement is an amorphous standard which, whatever else it does, does not automatically eliminate a "high percentage" of veterans. Because it is a purely subjective gauge and because the veteran's judgment is based on inadequate knowledge of costs and of what he is really entitled to, almost any wartime veteran can convince himself he cannot afford private hospital care.

I submit that the estimate of 21 million potential beneficiaries is quite valid. Certainly the VA has not enough beds to hospitalize all 21 million simultaneously; neither does the United States have enough beds to hospitalize its 165 million, but we do not deny that any citizen is a potential hospital patient.

Dr. Middleton, chief of the VA's department of medicine and surgery, speaking before a subcommittee of the House of Representatives at the appropriations hearings on the fiscal year 1958 budget, said: "We are confronted with the responsibility for the medical care, or possible medical care, of some 22 million veterans." The VA apparently accepts this as a valid estimate.

As the veterans grow older and chronic diseases become more prevalent, more and more veterans will decide they cannot afford private care and more veterans will become actually eligible, by signing the oath. Increased demand will lead to pressure for construction of more beds to accommodate these non-service-connected cases; this is the past history of the VA and it will be the future history, unless we act now.

4. *Chronicity of VA Load.*—Dr. Bell quotes the VA figures, which emphasize the "chronic" nature of the illnesses treated in VA hospitals; he seems to feel that, since so many veterans' disabilities are chronic (if we accept these figures), they are a legitimate federal responsibility.

Answer: The VA says "64.6 percent of the patients in Veterans Administration hospitals on November 30, 1954, had already been on the hospital rolls more than 90 days, and 49 percent had been hospitalized more than one year." Almost two-thirds of the daily patient load is, in other words, "chronic." But only 32.8% of the patient load consists of "chronic" patients with non-service-connected conditions, the remaining 31.8% is a segment of the 38% treated for service-connected disabilities, 7.9% with service-connected disabilities but treated for non-service-connected ailments,[1] and the 0.6% who were non-veterans, a total of 46.5% of the load. Almost half the "chronic" cases have service-connected disabilities.

Despite the emphasis on chronic cases in VA reports (the VA definition of "chronic" is discussed in a later section), roughly four patients of the VA with non-service-connected conditions are "nonchronic" to every six "chronic." But does chronicity, in itself, entitle a patient to federal aid?

The medical profession has never adopted the view that "chronic" patients should be federal wards. In 1953, concerning the temporary exception to its policy on veterans' care made for neuropsychiatric and tuberculous disabilities, the A. M. A. said, "The entire question of whether the care of these patients is a local or a federal responsibility must be reanalyzed by Congress . . . (C)ommunity facilities must be developed under state or local administration for the benefit of all."

In November, 1956, the A. M. A. advised the medical profession: "While the present law exists, we should help assure that veterans whose illness constitutes economic disaster will not be displaced by those suffering short-term remediable ills that, at the worst, constitute financial inconvenience."

Here again exception is made in recognition of existing laws, not in principle. The patient with a chronic condition is, admittedly, less likely to be able to pay than is the patient with short-term illness; but this probable inability to pay does not constitute an automatic lien on the federal government. The question still remains: "What is the proper source of care for the indigent patient?" Our answer still remains, "His own community."

In connection with chronic illness, it should be noted that the average age of the veteran patient is increasing. In 1955, 15.8% of our veterans were 55 or over, and, by 1970, we will have over 2 million veterans aged 65 or more. As the veteran ages, chronic illness be-

comes more likely and he is more likely to be unable to pay. Is it not odd, therefore, that chronic disease accounts for a smaller part of the non-service-connected than of the service-connected load? Might this not indicate that VA patients with non-service-connected conditions are admitted more on a basis of medical interest than of financial need?

5. *Competition with Private Institutions.*—This disparity between the increasing age of the veteran population and the diagnoses prevalent among VA patients with non-service-connected conditions illustrates one area in which the VA is "in competition with private medical institutions." Dr. Bell implies that "competition" can only be financial; if these patients say they are unable to pay, private medical institutions lose no money and, he says, the VA does not compete.

Answer: The American Medical Association does not oppose VA non-service-connected care merely because some VA patients might be able to afford private care. The VA's competition with private institutions is much more basic, and affects the health of the whole nation.

The nature of this competition was indicated at least three times in the address:

(a) In 1953, the A. M. A. discussion of neuropsychiatric and tuberculosis care requested congressional reanalysis of responsibility for this care, noted that "community facilities must be developed under state or local administration for the benefit of all," and pointed out the detrimental effect on the nation's health and economy of preferential treatment for veterans with these diseases.

(b) In Cincinnati, where the VA was determined to open a new, unneeded general medical and surgical hospital in an area adequately supplied with general medical and surgical beds (VA and non-VA), in spite of an acute need and a possibility of staffing for neuropsychiatric beds, the VA plan did not meet veteran needs and would aggravate health personnel shortages for the entire population of the area.

(In January, 1957, this hospital, with 39 tuberculosis beds, 78 neuropsychiatric, and 346 general medical and surgical, reported 40 tuberculosis patients, 70 neuropsychiatric, and 319 general medical and surgical. One-sixth of the tuberculosis load had service-connected conditions, one-third of the neuropsychiatric load, and 18 of the 319 general medical and surgical patients, less than 6%.)

(c) In the summation: "Through the VA program we are siphoning off personnel and facilities needed to develop adequate health facilities for all the American people, including the veterans and their families in their home communities."

These are the ways in which the VA competes with private medicine: as an alternate source of care for one-eighth of the population, making less urgent the pressure on states and communities to provide adequately for their own citizens; by creating an artificial personnel shortage; and by creating two medical systems and two classes of patients and thus interfering with the development of better care for all citizens. In addition, in its increasing emphasis on the acute non-service-connected case, it competes with nonfederal postgraduate training programs, which serve all citizens, not merely one class.

The medical profession opposes, not competition for the patient's dollar, but competition for the taxpayer's dollar—because funds which have gone to the VA for treatment of non-service-connected cases and for construction of new VA facilities in which to treat them could and should have been spent at the state and local level for care of all indigent citizens and for adequate facilities for the whole community.

Nonetheless, a comprehensive answer to the denial of VA financial competition must point out that the VA program is, in at least one facet, in direct financial competition with private physicians and hospitals. The law says that veterans without service-connected disabilities are eligible only if unable to pay for care, yet the VA has consistently admitted and treated veterans for disabilities or illnesses covered by workmen's compensation and health insurance, and has presented bills for such treatment, a practice which the A. M. A. considers unethical and in direct violation of the stated intent of the law. During fiscal year 1955, the VA collected almost 4 million dollars from nonfederal sources for medical care, most of which was collected under hospitalization contracts.

6. *Federal or Local Responsibility.*—Care should certainly be provided for indigent patients, but we do not agree with Dr. Bell that it is irrelevant whether it be provided at the local or federal level. The A. M. A. firmly believes that indigency is a community responsibility and that local administration is not only proper but also more efficient and more economical, as well as more fair to the citizen who is not a veteran, but is just as sick and broke as any man who served in uniform.

Within the community, all patients who receive publicly financed medical and hospital care because of indigency should receive equal benefits, according to their need. This is possible only when the community accepts its full responsibility and all care is administered at the local level, through local physicians and hospitals.

Dr. Bell considers VA care as "nothing more than an extension to the federal level of benefits for a group to whom the nation as a whole owes a debt, on a basis not materially different from that accorded at the state or local level, to citizens who qualify under laws of compensation or need." He considers veterans' compensation (payment for service-connected disability) "analogous" to workmen's compensation in private industry and "in non-service-connected cases it is analogous to the use of hospitals of states, municipalities, and charitable institutions for those unable to pay for services received."

Answer: Here is the crux of the disagreement: Must we divide our population into two groups, a privileged class who served in uniform and a "second-class" group who did not, because of age, physical disability, essential occupation, or even the arbitrary choice of the Selective Service System? The Bradley commission feels that "The Government's obligation is to

help veterans overcome special, significant handicaps incurred as a consequence of their military service. The objective should be to return veterans as nearly as possible to the status they would have achieved had they not been in military service."

This is a clear statement of the debt owed the veteran: full repayment for whatever adverse effect military service has on his future life. If non-service-connected care is payment of a debt, then all hardships a veteran encounters must be taken as resulting from his military service; we must believe that veterans are under a lifetime handicap—which most veterans themselves deny.

Arguments for non-service-connected care resemble that anomalous creature which is neither fish nor flesh nor fowl. If military service is the basis of entitlement, then the program is unfair to veterans who elect to pay their own way; if indigency is the basis, how does the veteran's indigency differ from the nonveteran's?

Service-connected compensation is not merely "analogous" to workmen's compensation; it is workmen's compensation for injury sustained as an employee of the nation. Non-service-connected care is not merely "analogous" to local indigent care; it is indigent care, but, for some unspecified reason, as a federal rather than a community responsibility.

If veterans are a special class of citizens (which is contended by certain groups, and put in practice by providing special care for veterans only, at the federal level, without regard to the origin of their disabilities), then, by logical extension, why limit it to those who cannot pay? If the sole basis of this care is indigency, then the federal government has usurped a responsibility of the state and the community.

Citizens in need of hospital care should receive it, at the expense of others if necessary, and we should work for medical and economic progress for all. But progress toward health should be through the state and community, not as a federally regulated, administered, and organized program, independent of and in competition with local governments.

7. *Road to Socialism.*—Dr. Bell states that, to his knowledge, no major veterans' organization has proposed broadening federal medical care coverage or supported socialism in any form. The A. M. A. has not stated or implied anything to the contrary nor was any group accused of such actions in the address.

Nonetheless, it is still true that one natural result of class legislation is that the nonprivileged classes desire equal benefits for themselves. Farmers and factory workers contributed to our war effort, often at sacrifice to themselves; in time of need, they may well ask why they must use up their savings, borrow or seek public aid for hospital care while the veteran without service-connected disabilities receives free care at their expense.

Continuation of the Veterans Administration's medical care program for non-service-connected disabilities and expansion to meet the expected increase in demand by eligible veterans certainly provides a pretext for this sort of pressure toward state medicine from nonveterans. Taking this pressure together with the VA's already great encroachment on the responsibilities of the communities and states, it is impossible to deny the danger inherent in the program. The medical profession does not accuse the veterans or the VA of planning or attempting to socialize this country—but, regardless of intent, the VA's present program and philosophy is well on the road which leads to that end. The American Medical Association is, therefore, attempting to persuade the public, veteran and nonveteran alike, to stop and read the sign-posts, before we reach the point of no return.

Statistical Disagreements

The questions of policy and philosophy discussed above are more important and basic than the statistical material used to indicate the magnitude and future trends of the VA hospitalization program. We will confine our comments, therefore, to the four factual arguments which Dr. Bell seems to feel contradict or militate against the address: (1) the VA one-day census of patients; (2) VA costs in relation to national income; (3) the General Accounting Office investigation of abuses; (4) VA beds in relation to veterans. (Paragraph numbers in the following section refer to the paragraphs in Dr. Bell's letter.)

1. *One-Day Census.*—"As of Nov. 30, 1954, the Veterans Administration hospital patient load included 53.5% who were receiving treatment for non-service-connected disabilities." (Par. 9)

This and the remainder of the paragraph is taken almost verbatim from the VA Administrator's report for fiscal year 1955, page 22. However, Dr. Bell has missed the breakdown of the other 46.5% of VA patients on page 21, which comprises 38% receiving treatment for service-connected disabilities and 7.9% with service-connected disabilities but hospitalized for non-service-connected ailments, as well as 0.6% nonveterans. Added to the 53.5% quoted above, this 7.9% gives a total of 61.4% hospitalized for treatment of non-service-connected disabilities, as stated.

Size of Chronic Load: The VA considers the one-day census a fair means of estimating the average distribution of the patient load, yet makes "certain observations" concerning the 20.7% cases classified as nonchronic and non-service-connected. The VA speculates that many of these will become chronic cases, either because they are "disabled" (degree of disability unstated) or because experience has shown that one-tenth of these patients (2% of the total load) will require more than 90 days of care. The net effect of this speculation is to give the impression that there are more chronic cases than are listed under this heading in the census breakdown. Such a conclusion is out of place and misleading, since, if the one-day census method is valid (as the VA claims) it will not be when distorted by inserting predictions as to the future of individuals.

It should also be noted that a chronic illness is, for the VA, defined by the patient's hospital stay: any patient who spends 90 days or more in a VA hospital is considered chronically ill, although the 90 days may include "3-day passes" out of the hospital, diagnosis, treatment, and rehabilitation. Compare this with the non-VA chronically ill patient, whose condition is

diagnosed and who is rehabilitated on an office or outpatient basis and is considered hospitalized only while he is in the hospital.

2. *VA Costs and National Income.*—Disagreeing on increasing VA costs, Dr. Bell says, "certainly the program requires a smaller percentage of the total national income than was the case 20 and 30 years ago." (Par. 11)

Federal sources state that national income in 1933 was 39.384 billion dollars and in 1955, 324.028 billion; the cost of VA medical and hospital care in 1934 was $37,038,000 and in 1955, $748,739,000. In the two decades, income increased about 8½ times, VA medical costs over 20 times.

Dr. Bell may be thinking of the argument popular several years ago, that the VA expended a smaller percentage of the national budget than in the 30's—ignoring, of course, the fact that the comparison was between a peacetime and a wartime budget. Even in terms of budgets, federal appropriations increased only about 9 times from 1934 to 1955, roughly in proportion to national income, and still very much out of proportion to VA medical increase.

3. *General Accounting Office Investigation.*—Dr. Bell quotes this investigation to prove indigency for the majority of VA patients with non-service-connected cases—a question which neither the address nor A. M. A. policy has disputed. However, for the sake of accuracy, I should point out that the General Accounting Office report mentioned by Dr. Bell (Par. 13) concerns two surveys: one based on investigation of 1,100 cases, to determine the financial condition of veterans who said they could not pay, and one based on 25,500 cases, to determine the accuracy of the veterans' statement of assets and liabilities. In quoting the General Accounting Office report, Dr. Bell has somehow combined the number of cases studied in the second survey with the conclusions drawn from the first; actually, the office reported 217 out of 1,100 (not 25,500) had annual incomes of $3,500 or more; 176 had net worths of over $5,000.

4. *VA Beds in Proportion to Veterans.*—Dr. Bell Bell states (Par. 14) that hospitalization for non-service-connected ailments is more difficult to obtain because of "tautened" administration and "because the proportion of beds to eligible veteran population has greatly decreased."

In 1926, when all 5 million veterans were unconditionally eligible for federal care, the system had 20,600 beds; in 1956, with a veteran population of 22,250,000, the VA had some 126,700 beds. In the past 30 years, although the veteran population has increased only 4.4 times and eligibility has been "curtailed," the veterans' hospital system has grown over 6 times as large.

Conclusions

It is true, as Dr. Bell points out in closing, that many veterans have been led to believe that they have a right to receive complete medical care for life in payment for the time they spent in uniform, whether or not they suffered any harm in service. This is true to such an extent that some veterans consider the "statement of inability to pay" a mere formality.

Yet the law is clear: non-service-connected care is to be provided only in unused beds in "existing facilities"; the primary purpose of the VA hospital system is the care of service-connected disabilities. This should mean that, as long as we have sufficient beds for service-connected cases, no new construction is needed and non-service-connected care will be provided only in the beds left empty when all service-connected cases are admitted. Yet the VA has, instead, built three times as many beds as it needs for all service-connected care and now asks Congress whether it should build more for non-service-connected cases. We may well ask what Congress means by "existing facilities"!

Is this the program which has not changed materially in 20 years? Can we possibly accept the statement that "The public, however, has not permitted or authorized an unrestricted hospitalization program"? Would it not be more accurate to say that the program first authorized in 1917 and amended in 1923, 1924, 1926, 1933, and 1934 has grown almost beyond recognition, not only without the authorization but almost without the knowledge of the people?

"If we are to expect our citizens of the future to give of their lives, if necessary, to protect that which we hold dear, then we must leave them a heritage of fairness, humanity, and recognition for special service unstintingly rendered." The medical profession has never opposed the idea of fairness, humanity, or special recognition for special service. It is for this reason the medical profession has worked unsparingly to improve the treatment program for veterans with service-connected disabilities.

But is all military service special service? Is it fair to say that any man who wears his country's uniform in time of conflict becomes thereby a ward of the government? Is it fair to say that our future citizens must be bribed to defend their country?

Or is it more just and prouder to say, with General Bradley, that "military service in time of war or peace is an obligation of citizenship and should not be considered inherently a basis for future Government benefits. . . . The performance of the DUTIES OF CITIZENSHIP cannot be expected to be painless or free from sacrifice." We believe, with the Bradley commission, that "what best serves the Nation in the long run will be in the best interest of the Veterans." President Roosevelt, over 20 years ago, expressed the same idea when he said:

". . . no person, because he wore a uniform, must thereafter be placed in a special class of beneficiaries over and above all other citizens. The fact of wearing a uniform does not mean that he can demand and receive from his Government a benefit which no other citizen receives."

We believe that our veterans are free men, who fought to keep their country free, not mercenaries, whose bravery and loyalty depends on the amount of spoils promised them.

Louis M. Orr, M.D.
Chairman, Committee on Federal Medical Services.

MEDICINE AND THE LAW

This is the 11th in a series of articles dealing with medical professional liability. An editorial (page 360) and a chronological résumé (page 364) appeared in THE JOURNAL, *Feb. 2. The preceding articles in this series have been published weekly in* THE JOURNAL *from Feb. 9, 1957, to April 6, and since then intermittently.*—ED.

HOW STATE MEDICAL SOCIETY EXECUTIVES SIZE UP PROFESSIONAL LIABILITY

During the past five years, there has been an increasing amount of interest and discussion in medical circles concerning medical professional liability. Personal opinions have been plentiful; however, authoritative answers on most phases of the subject have been few.

Why are physicians interested in the professional liability situation outside their immediate geographical area? One reason is that judgments and settlements in one state may be used as a precedent for future decisions and settlements in others. Another reason is that many physicians are in a quandary as to how much professional liability insurance they should carry. This decision, a personal one for each physician, is affected, in part, by the trend of medical professional liability claims and suits over the United States.

This is a report of the answers and attitudes of state medical society representatives, revealed in a survey on these problems. It is one part of the over-all survey of professional liability made by the Law Department. The other reports on the results of the survey will be published in this column in subsequent issues of THE JOURNAL.

During the late part of the summer of 1955, a three-part questionnaire on professional liability was sent to the medical societies of the 48 states and District of Columbia. Subsequently, this same questionnaire was sent to the Alaska and Hawaii medical societies. Replies, although in some instances incomplete, were received from all except those in Alaska, Idaho, Louisiana, and Maine. The questionnaire was answered by society secretaries, executive secretaries, chairmen of committees concerned with professional liability, attorneys for state societies, or insurance representatives. Here is what they had to say on the subject.

What are the most common causes of professional liability claims against physicians in your area?

Since the responses to this question are quite varied, they have been grouped in categories. Table 1 shows the number of times each cause was mentioned.

Excluding the miscellaneous category, it will be noted that approximately one-third of the causes listed have nothing to do with the medical care and treatment given by the physician. They relate to the ability of the physician to "get along" with his patients and/or other physicians.

What have been the effects of professional liability claims and suits on the reputation and on the practice of the physician involved?

A few medical society spokesmen explained that in the smaller communities in their state the effects of such claims and suits were more pronounced than in larger communities. Two responses indicated that the effect depended upon the amount of publicity given the case. A few responses disclosed that the effects were more adverse if the physician had previously been the subject of a professional liability claim or suit (table 2).

What has been the duration of the effects of claims or suits on a physician's practice and reputation?

The responses to this and the preceding question, although acknowledgedly only the opinion of the person filling out the questionnaire, would seem to contradict the widespread belief that a professional liability claim or suit seriously and permanently damages the physician's reputation (table 3).

Is professional liability insurance readily available in your state?

Without exception, all state society representatives replying to the questionnaire indicated that medical professional liability insurance was available to the physicians in their state. Furthermore, all of them except two stated that it was not difficult to obtain. One indicated that physicians in certain specialties had difficulty, and another said that difficulties had been encountered by physicians who had had a previous claim or suit brought against them.

What are the limits of professional liability insurance carried by physicians in your state?

The limits of coverage listed vary widely within a state and within the different types of practice. It would appear, from the answers given, however, that the average (median) coverage across the country for general practitioners is $25,000/$75,000 and for surgeons and other specialists $100,000/$300,000, this first figure in each instance representing the yearly

maximum coverage for one claim or suit and the second figure, the yearly maximum coverage for all claims and suits.

How many insurance companies write professional liability insurance in your state?

According to the responses to this question, there are at least 45 carriers writing medical professional liability insurance in the United States. One company operates in at least 28 states, 26 companies are active in only 1 or 2 states, and the remaining 18 companies fall between these limits.

Breaking these figures down, we find that, of the 18 companies, one writes insurance in 25 states, one in 20 states, one in 15, two in 14, one in 10, one in 9, two in 6, one in 5, four in 4, and four in 3.

In nine states there is only one company writing such insurance, while one state has 19 active carriers. The remaining states have between 1 and 19 carriers writing medical professional liability insurance.

Thirteen state societies indicated that they have a form of group insurance for their membership. One carrier writes this type of insurance in five states, whereas the other states' policies are underwritten by different companies.

TABLE 1.—*Causes of Professional Liability Claims*

Causes	No. of Times Listed
Poor results and/or failure in fields of:	
Surgery	23
Orthopedics (including surgery)	14
X-ray and therapy	9
Diagnoses	9
Medicine	8
Obstetrics and gynecology	6
Anesthesia	6
Eye, ear, nose, and throat	1
Excessive fees and/or efforts to collect fees resulting in counterclaims	16
Careless remarks made by other physicians	13
Poor rapport between physician and patient	4
Abandonment	3
Miscellaneous	22

Does your association have a claims-prevention program?

Twenty-one societies stated that they have a claims prevention program: California, Colorado, Connecticut, District of Columbia, Georgia, Kansas, Minnesota, Missouri, Montana, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Rhode Island, South Dakota, Utah, Virginia, Washington, West Virginia, and Wyoming.

What does your claims prevention program consist of?

Of the 21 societies with claims prevention programs, 15 offer an education course to their members. These societies are those in California, Colorado, Connecticut, District of Columbia, Georgia, Kansas, Montana, New Hampshire, North Carolina, Oklahoma, Rhode Island, Utah, Virginia, Washington, and West Virginia.

Listed below are the other activities mentioned: a one-day course held twice a year for new members, with lectures on problems relating to claims; one or two medical society meetings each year dealing exclusively with medical professional liability; discussions of professional liability hazards at county and state meetings; courses offered senior medical school students; round-table discussions for interns and residents; indoctrination lectures for new members on admission to the society; and panels of physicians and attorneys discussing the problem.

TABLE 2.—*Effects of Claims and Suits on Reputation and Practice of Physician Involved*

Effects	No. of States
None	20
Very little	10
Some	1
Varied	10
No answer	10
Total	51

In addition, many societies publish articles on the subject in their medical journal and distribute copies to their membership. A few states, as part of their claims prevention work, are attempting to improve the safeguards of professional work in hospitals and to improve public relations and doctor-patient relationships.

Does your association have a claims review program?

Thirty-one replies indicated that a claims review program was in operation at the state or county level. Such programs exist in Arizona, California, Colorado, Connecticut, District of Columbia, Georgia, Hawaii, Kansas, Kentucky, Maryland, Massachusetts, Minnesota, Mississippi, Missouri ,Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Dakota, Tennessee, Utah, Virginia, Washington, West Virginia, and Wyoming.

TABLE 3.—*Duration of Effects on Physician's Practice and Reputation*

Duration of Effects	No. of States
Extend over several years	5
Not more than two years	1
Not at all lengthy: a matter of months or weeks	32
Unknown	2
No answer	11
Total	51

What does your claims review program consist of?

The claims review programs are handled by claims review boards, committees, or administrators on a statewide or county basis. These committees and boards consist of from 3 to 14 physicians. Only one board had lay members, and this board had two such members. The members of these committees and boards are usually appointed by the president or the council of the society for a period of one, two, or three years. They review professional liability claims brought against the members and recommend whether

the claim should be settled or defended. Some of the boards or committees act only if requested to do so by the defendant physician. Some permit legal counsel and representatives of the insurance carrier that underwrites the defendant physician's professional liability insurance to participate. Some committees arrange for expert medical witnesses—others do not.

Does your society provide expert medical witnesses in litigated professional liability cases?

Twenty-three respondents said that their societies did not provide such witnesses. Twenty said that they would provide expert medical witnesses, and eight states did not reply to this question.

The states providing expert medical witnesses are Arizona, California, Georgia, Illinois, Kansas, Kentucky, Maryland, Minnesota, Mississippi, Montana, New Hampshire, New Jersey, New York, North Carolina, Oklahoma, South Dakota, Tennessee, Utah, Washington, and West Virginia.

Do any of the county medical societies in your state have claims prevention and/or claims review programs?

County medical societies in 15 states and Hawaii have claims prevention or review programs, and in 26 states they do not. We have no information concerning the situation in the other nine jurisdictions. Claims prevention and/or claims review programs have been established by county medical societies in Arizona, California, Connecticut, Georgia, Hawaii, Montana, New Hampshire, New Jersey, New York, Oklahoma, Pennsylvania, Tennessee, Utah, Virginia, West Virginia, and Wyoming.

Does your state medical association provide its members with group insurance, or does it approve such insurance?

The members of 13 state societies may obtain a form of "group" professional liability insurance protection through their state societies. Two state societies recommend to their membership two or more approved policies, and 28 societies do not do either of these things. Eight societies did not respond to this question.

Did your association ever have a group policy or an approved policy? Why were such policies discontinued?

Respondents in 23 states indicated that their state associations had previously had a group or approved policy, 22 said that they never had such policies, and 6 did not answer the question.

Following are some of the reasons given for terminating these group programs: The insurance carrier discontinued group coverage; no particular advantage demonstrated under the group policy; unsatisfactory experience; high loss ratio; not enough physicians participated; and group coverage held by state insurance department to be illegal.

Two responses were more specific in answer to this question. One stated that the physicians criticized the group program and grew resentful when the agent of the carrier pressured them to carry other types of insurance coverage. The other said that the rates were too high, that all of the participating members were being penalized because of a few habitually bad risks, and that the insurance company paid off claims to prevent suits without consulting the society, contrary to their agreement.

Did your association ever consider the adoption of a group professional liability insurance policy or approved policies?

Associations in 36 states have, at some time, considered the adoption of such policies, 7 never have, and 8 societies did not reply to the question.

State the reasons for not adopting a group or an approved policy.

Respondents of some of the state associations that did not adopt a group or an approved policy after considering it submitted the following reasons for the association's action: members wanted insurance to be handled by agent of their choice; suggested agent or carrier not licensed in state; group insurance contrary to state regulations and insurance laws; physicians did not want to be dependent upon one company for this insurance; society did not want to say that one insurance carrier was better than another, advantages to participating in group insurance not demonstrated, and high premiums; no carrier would underwrite a group policy in the state; and society not of sufficient size to make adoption feasible.

How many county medical societies in your state offer a group or an approved policy to its members?

A group professional liability insurance program is offered to the members of a county society in one state; while, in another state, some of the county societies offer a group program, and another county in the same state has approved two policies.

Summary

State medical society officials executing the questionnaire expressed the belief that generally a medical professional liability claim or suit does not have a serious or extended effect on the physician's practice or reputation. They also feel that professional liability insurance is generally not difficult to obtain. Nevertheless, the state societies recognize the importance and seriousness of this problem, and many have adopted claims prevention and claims review programs. It is interesting to note, however, that there are 31 review programs and only 21 claims prevention programs. The responses to the questionnaire indicated a need for a more systematic and thorough type of claims prevention program in the majority of the states.

MEDICAL NEWS

ALABAMA

First Annual Joint Meeting.—The medical staff of Redstone Arsenal and the Madison County Medical Society were joint hosts to the first annual Madison and adjoining counties medical meeting March 27 at Redstone Arsenal, Huntsville. About 100 doctors from the six-county area and nine out-of-area guests attended. "Preventive Medicine in Action" was the theme for the day. The trip to the water treatment plant had two special features: an explanation of the fluoridation process and a demonstration of protective equipment in use at Redstone. The group saw a demonstration of the procedures in preparing to fire the Corporal Missile. At the Army Hospital, they reviewed the medical program and the occupational health service.

The evening session began with a cocktail hour, followed by a banquet, at which Dr. W. H. Stallings, was master of ceremonies. Maj. Gen. John B. Medaris, commanding general, Army Ballistic Missile Agency, commented on preventive medicine and occupational health services. Dr. Logan T. Robertson, Asheville, N. C., in an illustrated address, emphasized the importance of preventive medicine in today's rapidly growing industrial world.

The president of the Madison County Medical Society is Dr. Grady Huckaby. The Plans-Arrangements Committee comprised Dr. Burton S. Shook, Dr. Norton E. Cowart, and Capt. John White, M. C., U. S. Army. The Protocol-Decorations Committee comprised Dr. Otis F. Gay, Capt. John Sims, M. C., U. S. Army, and Dr. A. L. Watson.

CALIFORNIA

Personal.—Dr. Harold G. Trimble, associate clinical professor, Stanford University School of Medicine, San Francisco, recently toured the Far East to discuss tuberculosis therapy in the United States. In New Delhi, he addressed the 14th International Tuberculosis Conference on "The Dynamic Approach to Pulmonary Tuberculosis—1957." Later he lectured at medical centers and universities in Manila, Calcutta, Bangkok, Hong Kong, and Tokyo. Dr. Trimble is a past-president of the American Trudeau Society and the California Tuberculosis and Health Association.

Postgraduate Conference in Medicine.—Stanford University School of Medicine will present a postgraduate conference in medicine from the afternoon of June 13 until noon, June 15, 1957. Registration is unlimited and will be open to doctors of medicine. The fee is not known. The conference will offer lectures and panel discussions presenting the practical approaches to common problems in cardiovascular disease, endocrinology, infection, and hematology. Diagnosis and treatment will be emphasized. Information may be obtained from the Office of the Dean, Stanford University School of Medicine, 2398 Sacramento St., San Francisco 15.

Physicians are invited to send to this department items of news of general interest, for example, those relating to society activities, new hospitals, education, and public health. Programs should be received at least three weeks before the date of meeting.

CONNECTICUT

Professor Cowgill Honored.—At the annual meeting of the American Institute of Nutrition in April, the annual Osborne and Mendel award was presented to George R. Cowgill, Ph.D., professor of nutrition, Yale University School of Medicine, New Haven. The award consists of a cash prize and a scroll. The citation called attention to Dr. Cowgill's "many pioneer and subsequent fundamental research contributions to our knowledge of the B-vitamins and of protein." Dr. Cowgill received his Ph.D. at Yale in 1921 and has been a member of the Yale faculty ever since. This award is named in honor of two distinguished scientists in the field of nutrition, Thomas B. Osborne, former research chemist at the Connecticut Agricultural Experiment Station, New Haven, and Lafayette B. Mendell, former professor of physiological chemistry at Yale. Both men, now deceased, were Yale graduates.

ILLINOIS

Chicago

Dr. Newman Honored.—Dr. Louis B. Newman, chief, physical medicine and rehabilitation service, Veterans Research Hospital, Chicago, has received the distinguished service award from the Illinois Institute of Technology for his outstanding service in physical medicine and rehabilitation. Dr. Newman received his M.D. from Rush Medical College in 1931, and an M.E. from Illinois Institute of Technology, in 1921. A former naval commander, he is also on the faculty at Northwestern University Medical School.

Personal.—The James Alexander Miller fellowship for the year beginning July 1 has been awarded to Dr. John E. Kasik, a senior assistant resident physician in the department of medicine at the University of Chicago. The grant of $7,000 is made yearly by the association to support fundamental medical research in tuberculosis. The antituberculosis drug, cycloserine, will be the subject of Dr. Kasik's research.—Dr. Maurice S. Mazel, of Chicago, spoke on "Surgical Treatment of the Coronary Artery Disease Problem" at the 50th annual convention of the Philippine Medical Association recently held in Baguio City.

Lasker Award to Dr. Katz.—The American Heart Association recently bestowed the Albert Lasker Award on Dr. Louis N. Katz, director, cardiovascular department, Medical Research Institute of Michael Reese Hospital. The award consists of three parts, a check for $1,000, a gold replica of the Winged Victory of Samothrace, and a citation. Dr. Katz has been

president of the American Heart Association and the Chicago Heart Association. He was a founder and president of the American Association for the Study of Atherosclerosis, and he is permanent honorary president of the Inter-American Society of Cardiology.

Chloroform and the Dedication of Guthrie Rock.—Recently the Chicago Medical Society dedicated the relocation of a 40-ton granite rock of Laurentide glacier origin as a memorial to Dr. Samuel Guthrie (1782-1848), the discoverer of chloroform. The dedication took place in Pasteur Park, Wood and Congress streets. Geologists estimated that the grey-red oval rock originated some 80 million years ago and that it was carried by the Laurentide glacier from the Waushara region in Central Wisconsin to Worth, Ill., a distance of more than 200 miles. It was discovered in Worth in 1885 by Guthrie's grandson, Ossian, known as the father of Chicago's drainage system. In 1903 Ossian Guthrie enlisted the aid of the Chicago Medical Society in an appeal to the South Park commissioners to have the rock placed at the lake front as a memorial. Permission was granted, but when the rock arrived at the foot of Jackson Boulevard in 1904, the Park District refused to accept it. The rock was taken to Rush and Ohio streets, while the controversy raged, and in 1912 it was placed in Washington Park, near 55th Street and South Parkway. In 1931 the Chicago Medical Society attached a plaque describing its purpose. A year ago the society undertook to have the rock moved to the West Side Medical Center, where it will be an inspiration to future as well as present members of the medical profession. Doctor Guthrie, in 1831, isolated what Dumas three years later named chloroform. It became known as Guthrie's "sweet whiskey." Chloroform came into widespread use about 1847.

INDIANA

Expand Medical Center Housing.—Scheduled for completion early in 1958, an apartment housing unit is under construction at the Indiana University Medical Center, Indianapolis, as the first in a series of units designed to meet the housing problems of students and staff. Plans also provide for a dormitory-type addition to the Student Union building, serving single students, and for additional apartment-type units in the future. The four-story apartment building will provide 105 one-bedroom units. The project is designed to alleviate a student housing problem at the Medical Center and provide additional housing for the first-year medical and dental classes which will be moved from the Bloomington campus to the Medical Center in the fall of 1958.

Personal.—Dr. Josephine Van Fleet, formerly chief of laboratory service, Veterans Administration Hospital, Indianapolis, has been appointed director of the Bureau of Laboratories, Indiana State Board of Health, Indianapolis, succeeding Samuel R. Damon, Ph.D., who had served as laboratory director since 1946.—Dr. Naomi L. Dalton, a native of Salem and graduate of Indiana University School of Medicine, Bloomington–Indianapolis, left Feb. 20 for Vellore, India, where she will serve as instructor and anesthetist at Christian Hospital and College. Dr. Dalton was in practice in Bloomington from 1941 to 1953 and recently served as associate director of anesthesiology at Mississippi Medical College. She will spend five years at the 560-bed hospital and college for medical students in South India.

Dedicate Psychiatric Research Institute.—Indiana's $1,500,000 building housing the Institute for Psychiatric Research was dedicated recently at the northwest corner of the Indiana University Medical Center, Indianapolis, adjacent to the state's Larue D. Carter Memorial Hospital. Dr. John I. Nurnberger is chairman of the department of psychiatry, at the School of Medicine. Dr. Daniel Blain, medical director, American Psychiatric Association, was principal speaker at the dedication. Other speakers included Governor George N. Craig, Dr. Margaret Morgan, president Herman B. Wells, of Indiana University, and Dr. Nurnberger, who outlined the aims and objectives of the psychiatric research program. The institute, a nonprofit organization, was established to receive gifts and other contributions for the support of research in mental illness.

LOUISIANA

University News.—Dr. Derrick Brien Jelliffe, for the past two years in Calcutta, India, as WHO visiting professor of pediatrics at the All-India Institute of Hygiene and Public Health, has been appointed visiting professor of tropical medicine at Tulane University School of Medicine. Dr. Jelliffe has served as medical inspector of the Sudan Medical Service in Africa; as senior lecturer in pediatrics at University College in Ibadan, Nigeria, and at University College of the West Indies in Jamaica. He is the author of "Infant Nutrition in the Subtropics and Tropics" and founder and present editor of the *Journal of Tropical Pediatrics*, presently printed in London, although the editorial offices are at the Tulane Medical School.

Course for Foreign Students.—Specialized intensive courses in English and the basic sciences for the benefit of foreign students beginning graduate study in the medical sciences will be inaugurated by Tulane University School of Medicine, New Orleans, with the help of a five-year $182,000 grant from the Rockefeller Foundation. William B. Wendel, Ph.D., professor of biochemistry has evolved a plan for a one-year intensive course beginning with English, advanced mathematics, and the principles of chemistry and physics in the summer. In the final months emphasis will be placed on basic courses in biochemistry and on an introduction to a research problem. The graduate school and the school of medicine will cooperate in offering the courses, which will be at the undergraduate or graduate level as needed.

MICHIGAN

Research Center in Ann Arbor.—Parke, Davis and Company recently announced the selection of a 50-acre site in Ann Arbor, near the University of Mich-

igan campus, as the location for its new 10 million dollar medical research center. The new structure is expected to be completed by early 1959. It will supplement the firm's present research facilities, directed by Leon A. Sweet, Ph.D., vice-president. It is anticipated that the present staff of about 400 persons will be increased by "a substantial number of persons."

Personal.—Wayne State University recently bestowed the honorary degree of doctor of arts on Dr. Alfred Heacock Whittaker, Detroit, who has served as surgeon on the staffs of Evangelical Deaconess, Harper, Children's, and Detroit Memorial hospitals. Dr. Whittaker is also a commissioner on the Detroit City Plan Commission, president of Future Detroit, Inc., and medical advisor to the Franklin Settlement. He is a former president and trustee of the Detroit Historical Society and the Economic Club of Detroit.

Establish Physical Medicine Academy.—Physiatrists in Michigan have organized an Academy of Physical Medicine and Rehabilitation incorporated under the laws of the State of Michigan. The officers are Dr. Max K. Newman, president; Dr. James W. Rae, vice-president; Dr. Frederic B. House, secretary-treasurer; and Drs. George H. Koepke, Robert C. Dean, and William C. Schaefer, trustees. The objectives of the academy are to promote the science and art of medicine and the betterment of public health through understanding and utilization of the functions and procedures of physical medicine and rehabilitation. The registered office of the Academy has been designated as the University Hospital, 1313 E. Ann St., Ann Arbor. Communications may be sent to the Secretary, 326 N. Ingalls St., Ann Arbor.

MONTANA

Esophageal Speech Clinic.—The Montana Society for Crippled Children and Adults plans an esophageal clinic for laryngectomized adults to be held at Billings, June 10-15. Five speech therapists will be available for intensive therapy. The Montana Division of the American Cancer Society will cooperate with this project and will help defray transportation and maintenance costs for patients receiving therapy. Physicians desiring registration blanks for laryngectomized patients or information are requested to write the Montana Society for Crippled Children and Adults, P. O. Box 861, Billings.

Institute for Maternal Care.—Representatives of the Maternal and Child Welfare Committee of the Montana Medical Association, the Montana League of Nursing, and the State Board of Health will sponsor an Institute for Maternal and Newborn Care for physicians and registered nurses June 9-12 at the Western Life Building, Helena. The Institute will provide an opportunity for physicians and nurses to review trends and new concepts in medical and nursing responsibilities for maternal and newborn care. Guest speakers will be Dr. James B. Arey, Philadelphia, pediatric pathologist, Temple University; Gertrude Church, Denver, nursing consultant, U. S. Children's Bureau; Dr. William P. Given, New York, department of obstetrics, New York Lying-In Hospital; Vera Keane, New York, instructor-supervisor in obstetrics and gynecology, New York Hospital School of Nursing. Registration fee is $15.

NEBRASKA

Society News.—The new officers of the Omaha Mid-West Clinical Society are Dr. Charles F. Moon, president; Dr. Earl A. Connolly, president-elect; and Dr. Payson S. Adams, secretary-treasurer. The next annual clinical assembly will be at the Fontenelle Hotel, Omaha, Nov. 4-7.

Anatomy Teacher Honored.—John S. Latta, Ph.D., chairman of the department of anatomy, University of Nebraska College of Medicine, Omaha, was awarded a personal prize for "outstanding teaching" in the field of science at the 29th annual honors convocation in Lincoln recently. The distinguished teaching award, a bronze medal and a $1,000 check, was presented to Dr. Latta by the University of Nebraska Foundation. Dr. Latta has been associated with the department of anatomy at the College of Medicine since 1921, serving as chairman of the department since 1941.

NEW HAMPSHIRE

Gordon Research Conferences.—The Gordon Research Conferences will be held from June 10-August 30 at Colby Junior College, New London, at New Hampton School, New Hampton, and at Kimball Union Academy, Meriden. The conferences were established to stimulate research in universities, research foundations, and industrial laboratories. The purpose is to bring experts up to date on the latest developments, analyze the insignificance, and provoke suggestions as to underlying theories and methods of approach for making new progress. Sufficient time is available to stimulate informal discussions. Meetings are held in the morning and evening, Monday through Friday, with the exception of Friday evening. The afternoons are available for recreation, reading, or participation in discussion groups. Information presented is not to be used without specific authorization of the individual making the contribution. No publications are prepared as emanating from the conferences. Attendance at each conference is limited to 100. For information write W. George Parks, Director, Department of Chemistry, University of Rhode Island, Kingston, R. I.

NEW YORK

Residency in Neurology.—A three-year approved residency in neurology has been inaugurated at the Bronx Municipal Hospital Center and the Albert Einstein College of Medicine. The residency program is supported by a training grant from the National Institute of Neurological Diseases and Blindness. The division of neurology of the department of medicine at present consists in three full-time physicians: Drs. Saul R. Korey, Labe C. Scheinberg, and Robert Katzman. Two 60-bed wards will be assigned to neurology, with clinical research laboratories in direct conjunc-

tion with the wards. In addition to the clinical training, an extensive fellowship program, in the sciences related to the nervous system, supported by the National Institute of Mental Health, is offered on an interdisciplinary basis.

Personal.—Dr. Marc H. Hollender, chairman, department of psychiatry, State University of New York College of Medicine, Syracuse, has been given the additional appointment of director of Syracuse Psychopathic Hospital. Dr. Hollender previously served in Chicago, as associate professor of psychiatry at the University of Illinois College of Medicine, as a staff member of the Institute for Psychoanalysis, a senior consultant to the Veterans Administration Mental Hygiene Clinic, and a consultant to the Chicago State Hospital. Dr. Mary F. Brew, who has been associated with the Syracuse Psychopathic Hospital since its opening, will remain as assistant director. As director, Dr. Hollender succeeds Dr. Richard F. Binzley, who has been serving as acting director since his appointment as assistant commissioner of the department of mental hygiene in October, 1954.

Nutrition Institute at Syracuse.—The College of Home Economics, Syracuse University, and the Nutrition Bureau, New York State Department of Health, are sponsoring the 11th Community Nutrition Institute at Syracuse University for the 11th consecutive year June 17-29. The institute presents a public health approach to nutrition problems for nutritionists, physicians, nurses, dentists, dietitians, and health educators. The institute will consider the effectiveness of public health nutrition programs; carbohydrate, fat, and protein metabolism; coronary heart disease and high protein diets; enzymes; hormones; and vitamins in the metabolism of protein, fats, and carbohydrates. Panel discussions covering all topics are scheduled. For information write Anne Bourquin, Ph.D., Department of Foods and Nutrition, College of Home Economics, Syracuse University, Syracuse, N. Y.

New Mental Hospital in the Bronx.—A hospital designed to provide the latest advances in the treatment of the mentally ill is to be built by the Department of Mental Hygiene of the State of New York at a cost of 70 million dollars on 125 acres of reclaimed marshland along the Hutchinson River Parkway in the Bronx. It is the first new mental hospital to be built by the State in 25 years and will accommodate 3,000 patients. Governor Averell Harriman pointed out that the location adjacent to the Albert Einstein Medical Center provided the basis for a mutually beneficial arrangement whereby the two institutions will cooperate. Nearby also are the East Bronx General Hospital and the East Bronx Tuberculosis Hospital. Facilities will be adequate for both inpatient and outpatient care, including a service which enables patients to spend the day participating in a regular therapeutic program and to return to their homes at night. In addition to occupational therapy centers in the various patients buildings, a separate building will be provided for occupational therapy. A central library will be supplemented by branch libraries. Patients buildings will contain interior recreation areas. Outdoor recreation areas will be adjacent to patients buildings. Other features include a medical-surgical building, geriatric building, a diagnostic clinic, research unit, and a community center containing an auditorium, chapel, and restaurant.

Establish Alcoholism Program.—A $168,000 program to attack the problem of chronic alcoholism through education, research, training, and clinical demonstration will be undertaken during the coming year by the New York State Interdepartmental Health Resources Board. Fellowships will be made available to physicians, social workers, nurses, educators, and other professional personnel. Priority will be given to persons who are participating or who plan to work in community education on treatment programs for so-called problem drinking. The board is already supporting an outstanding research project being conducted at the State University of New York College of Medicine, Brooklyn, under the direction of Dr. Howard Potter, dean and director of psychiatry, and Dr. Benjamin Kissin, internist. The project will receive an additional grant of $80,000 from the State this year to conduct its research along various lines, including social, economic, clinical, psychiatric, and pharmaceutical aspects of alcoholism. Assisting the board in the program development is an advisory committee of consultants representing psychiatry, internal medicine, the legal profession, and the courts. Dr. John L. Norris, medical director, Eastman Kodak Company, Rochester, is chairman of this committee. The board will continue for one additional year to provide financial assistance for the pilot demonstration alcoholism clinics. One such clinic is operated in Rochester by the Tuberculosis and Health Association of Rochester and Monroe County, Inc. The second clinic is operated by the Broome County Committee on Alcoholism, Inc., in Binghamton.

New York City

Dr. Landauer Honored.—Dr. Kenneth S. Landauer, director, Respirator Center Services for the National Foundation for Infantile Paralysis, has received a citation from the medical directors of the nation's 15 respirator and rehabilitation centers. The citation states that Dr. Landauer's "selfless dedication to human service, vision and untiring efforts toward the accomplishment of the 'Respirator Center' program have done much to remold our medical thinking."

Dr. Davis Goes to Harvard.—Dr. Bernard D. Davis has been appointed head, department of bacteriology and immunology, Harvard Medical School, Boston. Dr. Davis, currently chairman of the department of pharmacology, New York University College of Medicine, will begin his service at Harvard July 1. He succeeds Dr. J. Howard Mueller who served as chairman of the department from 1942 until his death in 1954. Dr. Davis was commissioned in the U. S. Public Health Service in 1942 and was appointed in 1954 to a professorship at New York University College of Medicine.

Study of Eczema in Infants.—The University Hospital of New York University–Bellevue Medical Center has received a grant of $147,255 from the John A. Hartford Foundation for a study of eczema in infants. The following techniques will be used: (1) skin tissues will be studied; (2) measurements will be made of specific food antigens and antibodies occurring in normal as well as in eczematous infants; and (3) a study will be made based on the thought that mineral and water metabolism and the amino acid metabolism may be concerned in the development of eczema. Drs. L. Emmett Holt Jr., Adolph G. G. DeSanctis, and Lewis Thomas will direct the project.

Rockefeller Institute Expands.—The Rockefeller Institute will construct four new buildings with two gifts totaling 5 million dollars that have been received from the estate of the late Alfred H. Caspary and from John D. Rockefeller Jr. The three million dollars from the Caspary estate will be used for a graduate student residence hall, an auditorium, and a president's house. Alfred H. Caspary Hall, which is under construction, includes an auditorium that will seat 500, six smaller auditoriums and conference rooms, and executive offices. The Caspary gift is the largest contribution ever made to the institute from outside the Rockefeller family. The Rockefeller gift provides as much as 2.5 million dollars for the construction and furnishing of a building to be known as Abby Aldrich Rockefeller Hall in memory of Mr. Rockefeller's first wife. The hall will serve as a social and residential center for scientists from all parts of the world who are visiting New York and for the institute faculty. The building will contain facilities for 24 visiting scientists. Alfred H. Caspary Hall and Abby Aldrich Rockefeller Hall will fulfill four new functions in the development of the institute as an international science center: (1) encourage scientists from all over the world to meet and live together for brief or extended periods of time in order to exchange ideas and synthesize important sectors of the rapidly accumulating mass of scientific knowledge; (2) transmit scientific knowledge to young people and the general public; (3) provide ideal facilities for meetings of scientific societies; (4) encourage the cultural life of the institute faculty. Abby Aldrich Rockefeller Hall, Caspary Hall, and the 13-room president's house are scheduled for occupancy this summer. Plans for the graduate residence hall are now in development.

OHIO

Dr. Macklin Receives Blackwell Award.—Dr. Madge T. Macklin, research associate in medicine, Ohio State University College of Medicine, received the Elizabeth Blackwell award for outstanding contributions in the field of medicine recently. The award was presented at the New York Infirmary, which was founded by Elizabeth Blackwell, first woman medical graduate, who received her M.D. degree in 1848. A graduate of Goucher College, from which she also received an honorary degree and a special citation, Dr. Macklin received her medical degree from Johns Hopkins University, Baltimore. Presently she is engaged in research in retinoblastoma.

Personal.—Dr. and Mrs. Michael Balint, of London, have been appointed, on a continuing basis, as visiting professor of psychiatry and as visiting associate professor of research in behavioral science, respectively, at the University of Cincinnati, College of Medicine. They will be in residence in this center for one month each year, to give seminars on psychodynamics, individual psychotherapy, and group psychotherapy. Dr. Balint for many years was director of the Budapest Institute of Psychoanalysis. At present Dr. and Mrs. Balint are in practice in London and are staff members of the London Institute of Psychoanalysis and the Tavistock Clinic.

OREGON

Establish Cardiovascular Chair.—The Oregon Heart Association has donated a chair of cardiovascular research to the University of Oregon Medical School, Portland. Under the terms of the grant, the association will pay a portion of the salary of the man selected to fill the position and will contribute annually for other expenses including technical assistance, equipment, supplies, and travel to scientific meetings. For information write the University of Oregon Medical School, 3181 S. W. Sam Jackson Park Road, Portland 1, Ore.

Personal.—Dr. Merle W. Moore, associate head, division of allergy, University of Oregon Medical School, Portland, was named president-elect of the American College of Allergists at its annual congress in Chicago recently. Dr. Orval R. Withers, Kansas City, Mo., was named president. Retiring president of the college is Dr. Ethan Allen Brown, Boston.——The appointment of Joseph D. Matarazzo, Ph.D., associate psychologist, Massachusetts General Hospital, Boston, as full-time professor of medical psychology at the University of Oregon Medical School, Portland, was announced recently. The appointment becomes effective June 1.

PENNSYLVANIA

Plaques for Centenarians.—For the 10th consecutive year, The Medical Society of the State of Pennsylvania will present hand-lettered testimonial plaques to those residents of the Commonwealth who attain their 100th birthday. The society requests that the names and date of birth of residents of the State who will be 100 years old in 1957 be sent to The Medical Society of the State of Pennsylvania, 230 State St., Harrisburg.

Philadelphia

Student Loan Funds.—Dr. Herman Gold, Chester, has given $10,000 in stocks to the University of Pennsylvania to provide financial assistance to worthy students in the school of medicine through scholarship grants or student loans.

Personal.—Dr. William Bates, Philadelphia, who retired two years ago as chairman, department of surgery, University of Pennsylvania Graduate School of Medicine, has been appointed director of medical education at the Harrisburg Polyclinic Hospital. He is a

past-president of the Philadelphia County Medical Society and a former member of the A. M. A. House of Delegates.

Course on Principles of Rehabilitation.—Information has been sent to the Council stating that a course for physicians, "Principles of Rehabilitation," will be conducted by the Rehabilitation Center of the Hospital of the University of Pennsylvania, June 17 to 21, in cooperation with the Office of Vocational Rehabilitation, United States Department of Health, Education, and Welfare. The five-day course is designed to present the basic concepts of rehabilitation through lectures and demonstrations. The instructional staff will include representatives from the various divisions of the University of Pennsylvania as well as guest lecturers.

Provision for granting trainee stipends of $100 to persons attending the course has been made by the U. S. Office of Vocational Rehabilitation. Registration will be limited. Application for these stipends and requests for detailed information concerning the course may be addressed to the Rehabilitation Center, Hospital of the University of Pennsylvania, Philadelphia 4.

WASHINGTON

Appoint Physical Medicine Professor.—Appointment of Dr. Justus F. C. Lehmann, Columbus, Ohio, as the University of Washington Medical School's first professor of physical medicine and rehabilitation was approved January 12. Dr. Lehmann has been associate director of the department of physical medicine and rehabilitation at Ohio State University since 1955. The new appointment is one of the final steps toward the establishment of a long-sought rehabilitation center at the university. The rehabilitation center would accept patients, upon referral of the patients physician, from all parts of the State.

WISCONSIN

Annual Clinical Day at VA Center.—The Tenth Annual Clinical Day, Marquette University Medical School, Dean's Committee, will be held at the Veterans Administration Center in Wood, Wisconsin on June 22. A clinical program of some 21 ten-minute presentations in the fields of urology, medicine, dermatology, surgery, ophthalmology, and otolaryngology will be presented beginning at 8:45 a. m. The chairman of the Dean's Committee is Walter Zeit, Ph.D., director, Department of Anatomy at Marquette University Medical School in Milwaukee.

GENERAL

Louis Braille Award.—Establishment of the Louis Braille Award to be presented annually in June by the Philadelphia Association for the Blind has been announced. Any person or organization may be considered as a candidate. The award shall be presented solely for achievement in the fields of prevention of blindness or services to the blind. Nominations for the award may be made at any time during the year, but to be considered for selection for the calendar year, nominations must be received by the Board of Judges not later than June 10.

For information write Thomas A. Benham, President, Philadelphia Association for the Blind, 100 E. Price St., Philadelphia 44, Pa.

Decrease in Poliomyelitis.—According to the morbidity and mortality weekly report of the U. S. Public Health Service, the number of cases of poliomyelitis reported in the first 19 weeks of this year in Continental United States was 783, as compared with 1546 cases reported for the same period of 1956. For the week ending May 11, 1957, the total number of cases was 71, as compared with 85 cases for the same week in 1956. Of the 71 cases, 26 were paralytic, as compared with 40 paralytic cases for the same week in 1956. Of the 71 cases, 18 were reported from California and 15 from Texas.

Winners of Dermatological Essay Contest.—The American Dermatological Association announces the following awards in its annual essay prize contest: first prize, $500, to Drs. Peter Flesch and Elizabeth C. Jackson Esoda, Philadelphia, for "Defective Epidermal Protein Metabolism in Psoriasis"; second prize to Dr. Robert B. Pittelkow, Milwaukee, for "Systemic Candidiasis and a Study of the Amino Acid Excretion Patterns by Microbiological Assay"; third prize to Dr. Richard K. Winkelmann, Rochester, Minn., for "The Muco-Cutaneous End Organ—The Primary Organized Sensory Ending in Human Skin"; and fourth prize to Dr. William B. Reed, Washington, D. C., for "Vascular Reactions in a Chronically Inflamed Skin." Another essay contest will be sponsored this year.

Physical Medicine Fellowship.—The Department of Physical Medicine and Rehabilitation of the New York University–Bellevue Medical Center, through a grant given it by Miss Belle Baruch, has created a two-year fellowship for postgraduate training in physical medicine and rehabilitation. This fellowship, to be known as the Frances Milam Fellowship, is named for Miss Milam, who is a resident of Georgetown, S. C., and a severely handicapped victim of poliomyelitis. First consideration in awarding this fellowship will be given to physicians who are residents of South Carolina. Application forms may be secured from Dr. J. G. Benton, Institute of Physical Medicine and Rehabilitation, New York University-Bellevue Medical Center, 400 E. 34th St., New York City.

Fellowships Available—The Helen Hay Whitney Foundation, New York City, has announced that fellowships are available to properly qualified persons in the United States or abroad, up to the age of 35, holding the degree of M.D., Ph.D., or their equivalent, who are seriously considering a career in biological or medical research, preferably relating to connective tissue and its diseases. Fellowships are annual, subject to renewal consequent to good performance for a period of three years. Stipends will be arranged to

meet the needs of the fellow. Applications, to be submitted before Sept. 15, should be requested from the Executive Secretary, The Helen Hay Whitney Foundation, 525 E. 68th St., New York 21. The foundation was established in 1947 to support research of rheumatic fever. Its activities have recently expanded to include the study of connective tissue and its diseases.

Mental Health Grant.—The Western Interstate Commission for Higher Education has received a $171,000 grant from the National Institute of Mental Health to improve and expand mental health training and research in the western states. Harold L. Enarson, Ph.D., director of the commission, said the money would be used (1) to encourage closer working relationships between western medical schools and the state mental hospitals, (2) to help promote interstate mental health research, and (3) to aid in organizing interstate mental health training programs. The grant covers a four-year period. The sum of $56,000 will be made available June 1 to cover the first year of the new program. It will make possible the creation of a western mental health council and the addition of several mental health experts to the commission's staff in Boulder, Colo.

Congress on Rheumatic Diseases.—The ninth International Congress on Rheumatic Diseases will be held at the Royal York Hotel, Toronto, Ont., Canada, June 23-28. The official languages of the congress will be English, French, German, and Spanish. Speakers from Sweden, India, Poland, England, Spain, and other countries are scheduled. Anatoli Nesterov, Moscow, will speak on "Neurogenic Factors in Pathogenesis and Clinical Features of Rheumatism," and Frantisek Lenoch, Prague, Czechoslovakia, will present "Does Rheumatic Iritis and Iridocyclitis Exist?" Social program includes the president's ball June 24, and the congress banquet June 27. Scientific and commercial exhibits and tours of medical centers are planned. Two post-congress tours have been organized, one going to the Philadelphia area and the other to Detroit, Chicago, and Rochester, Minn. Any physicians or medical scientists may become members of the congress. Active membership fee is $25. For information write Dr. Donald C. Graham, Chairman, Ninth International Congress on Rheumatic Diseases, P. O. Box 237, Terminal "A", Toronto, Ont., Canada.

CORRECTION

Artane and Kemadrin.—Concerning his article in THE JOURNAL, April 13, 1957, page 1352, on the treatment of paralysis agitans, Dr. Lewis Doshay writes, "In the first paragraph of the paper Artane and Kemadrin appear in parentheses as trade names of Trihexyphenidyl. While this is true of Artane, it is not so with regard to Kemadrin, which is Procyclidine Hydrochloride. Kemadrin differs from Artane at the right end of the formula, where there is a pyrrolidine ring with 4 carbons and 1 nitrogen atom instead of the 5 carbons and 1 nitrogen atom ring associated with Artane. A correction of the error would be appreciated."

EXAMINATIONS AND LICENSURE

AMERICAN BOARD OF ANESTHESIOLOGY: *Part I.* Various locations, July 19. Final date for filing application was Jan. 19. American Board of Anesthesiology. *Oral.* Washington, Oct. 28-Nov. 1. Sec., Dr. Curtiss B. Hickcox, 80 Seymour St., Hartford 15.

AMERICAN BOARD OF DERMATOLOGY: *Written.* Several cities, June 27. *Oral.* Baltimore, Oct. 11-13. Final date for filing application was April 1. Sec., Dr. Beatrice Maher Kesten, One Haven Ave., New York 32.

AMERICAN BOARD OF INTERNAL MEDICINE: *Written.* Oct. 21. *Oral.* Los Angeles, Sept. 11-14. Final date for filing applications was Feb. 1. Exec. Sec., Dr. W. A. Werrell, 1 West Main St., Madison 3, Wis.

AMERICAN BOARD OF NEUROLOGICAL SURGERY: Examination given twice annually, in the spring and fall. In order to be eligible a candidate must have his application filed at least six months before the examination time. Sec., Dr. Leonard T. Furlow, Washington University School of Medicine, St. Louis 10.

AMERICAN BOARD OF OBSTETRICS AND GYNECOLOGY: Applications for certification, new and reopened, for the 1958 Part I examinations are now being accepted. Deadline for receipt of applications is September 1. Sec., Dr. Robert L. Faulkner, 2105 Adelbert Road, Cleveland 6, Ohio.

AMERICAN BOARD OF OPHTHALMOLOGY: *Oral.* Chicago, Oct. 7-11. *Written.* January 1958. Final date for filing application is July 1. Sec., Dr. Merrill J. King, Box 236, Cape Cottage Branch, Portland 9, Maine.

AMERICAN BOARD OF ORTHOPAEDIC SURGERY: *Part II.* New York City, Jan. 29-31, 1958. Final date for filing application is August 15. Sec., Dr. Sam W. Banks, 116 South Michigan Avenue, Chicago 3.

AMERICAN BOARD OF OTOLARYNGOLOGY: Chicago, Oct. 7-11. Final date for filing application was in April. Sec., Dr. Dean M. Lierle, University Hospitals, Iowa City.

AMERICAN BOARD OF PATHOLOGY: *Oral and Written. Pathologic Anatomy and Clinical Pathology.* New Orleans, Sept. 26-28. Final date for filing application is August 15. Sec., Dr. Edward B. Smith, Indiana University Medical Center, Indianapolis 7.

AMERICAN BOARD OF PEDIATRICS: *Oral.* San Francisco, June 21-23. Sec., Dr. John McK. Mitchell, 6 Cushman Road, Rosemont, Pa.

AMERICAN BOARD OF PHYSICAL MEDICINE AND REHABILITATION: *Parts I and II.* New York City, June 8-9. Final date for filing application was March 1. Sec., Dr. Earl C. Elkins, 200 First St., S. W., Rochester, Minn.

AMERICAN BOARD OF PROCTOLOGY: *Oral and Written. Parts I and II.* September. Sec., Dr. Stuart T. Ross, 520 Franklin Ave., Garden City, N. Y.

AMERICAN BOARD OF PSYCHIATRY AND NEUROLOGY: New York, Dec. 16-17. San Francisco, March 17-18. Sec., Dr. David A. Boyd, Jr., 102-110 Second Ave., S. W., Rochester, Minn.

AMERICAN BOARD OF RADIOLOGY: Washington, Sept. 23-28. Final date for filing application was June 1. Within the near future a special examination for certification in Nuclear Medicine will be offered to diplomates in Radiology and Therapeutic Radiology. Sec., Kahler Hotel Bldg., Rochester, Minn.

AMERICAN BOARD OF SURGERY: *Part II.* New York, June 10-11. Sec., Dr. John B. Flick, 225 S. 15th St., Philadelphia 2.

AMERICAN BOARD OF UROLOGY: *Written examination.* Various cities throughout the country. *Pathology and Oral Clinical.* February 1958. Location not decided. Exec. Secretary, Mrs. Ruby L. Griggs, 30 Westwood Road, Minneapolis 16.

BOARD OF THORACIC SURGERY: *Written.* Various centers throughout the country, September 1957, and the closing date for registration is July 1, 1957. Sec., Dr. William H. Tuttle, 1151 Taylor Ave., Detroit 2.

DEATHS

Cetrulo, Gerald Italo ✠ Newark, N. J.; born in Newark Dec. 28, 1907; University and Bellevue Hospital Medical College, New York City, 1931; certified by the National Board of Medical Examiners; fellow of the American College of Surgeons; recently appointed assistant dean in charge of postgraduate education in the College of Medicine and Dentistry at Seton Hall University in Jersey City, where he was director of medical education since 1945 and from 1938 to 1942 taught physical education and health anatomy and physiology; veteran of World War II; for many years chairman of the medical education committee of the Essex County Medical Society; assistant medical director, Martland Medical Center; on the staffs of the Clara Maass Memorial and Columbus hospitals; in his youth was a champion fencer and in 1932 served on the United States Olympic team; died at the New York International Airport, Idlewild, in New York City, March 10, aged 49, of arteriosclerotic heart disease.

Goldstein, Louis ✠ Philadelphia; born May 23, 1887; Temple University School of Medicine, Philadelphia, 1923; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; served as associate professor of dermatology and syphilology at the Hahnemann Medical College; on the staffs of St. Joseph's Hospital, Skin and Cancer Hospital, and St. Vincent's Hospital for Women and Children; died in the Graduate Hospital of the University of Pennsylvania March 17, aged 69, of cancer of the pancreas.

Dickson, Roger William ✠ Atlanta, Ga.; Emory University School of Medicine, Atlanta, 1922; specialist certified by the American Board of Pediatrics; served as professor and chairman of the department of pediatrics at his alma mater; fellow of the American Academy of Pediatics; past-president of the Georgia Pediatric Society; an attending pediatrician at Emory University Hospital, Grady Memorial Hospital, Piedmont Hospital, and Crawford W. Long Hospital; drowned in the Chattahoochee River Feb. 22, aged 60.

Borghoff, John Aloysius ✠ Omaha; University of Nebraska College of Medicine, Omaha, 1920; professor of dermatology at Creighton University School of Medicine; specialist certified by the American Board of Dermatology and Syphilology; member of the American Academy of Dermatology and Syphilology; on the staffs of Creighton Memorial St. Joseph's Hospital, St. Catherine's Hospital, and Douglas County Hospital; died Feb. 21, aged 61.

Bowes, Frank Arthur, Waterbury, Conn.; Harvard Medical School, Boston, 1915; veteran of World War I; affiliated with St. Mary's Hospital; served as physician for the Welfare Department, and as police and fire surgeon; died in the Veterans Administration Hospital, West Haven, Feb. 24, aged 68, of lobar pneumonia.

✠ Indicates Member of the American Medical Association.

Copeland, Samuel James ✠ Indianapolis; Indiana University School of Medicine, Indianapolis, 1909; served on the staffs at Indianapolis General, St. Vincent's, and Methodist hospitals; died March 2, aged 79, of coronary occlusion.

Coseglia, Robert Paul ✠ Detroit; University of Illinois College of Medicine, Chicago, 1935; member of the American Academy of General Practice; on the staffs of Holy Cross Hospital, where he was staff secretary, Detroit Memorial, East Side General, and St. John hospitals, and Saratoga General Hospital, where he died Feb. 25, aged 47, of coronary thrombosis.

Curtiss, Charles Erwin, Manlius, N. Y.; Syracuse University College of Medicine, 1903; an associate member of the American Medical Association; veteran of World War I; formerly member of the Manlius High School Board of Education; for many years mayor of Manlius; served on the staff of the Crouse-Irving Hospital in Syracuse; died Feb. 16, aged 77.

Dowden, Albert Porter, Louisville, Ky.; University of Louisville Medical Department, 1900; died Feb. 26, aged 80.

Ehle, Amos E., Richmond, Ind.; Eclectic Medical Institute, Cincinnati, 1896; died in Centerville Feb. 23, aged 87, of cerebral thrombosis.

Luthy, Karl Robert, Indianapolis; Drake University College of Medicine, Des Moines, 1910; service member of the American Medical Association; served as medical director of the U. S. Rubber Company plant in Mishawaka, Ind.; died Jan. 29, aged 68, of coronary occlusion.

Lynch, Harry Orange, Kansas City, Mo.; Tulane University School of Medicine, New Orleans, 1929; service member of the American Medical Association; veteran of World War II; associated with the regional office, Veterans Administration; died Feb. 18, aged 53, of coronary thrombosis.

Martin, Orel F., Coral Gables, Fla.; Middlesex University School of Medicine, Waltham, Mass., 1918; veteran of World War I; died Jan. 7, aged 64, of cirrhosis of the liver.

Mears, Burleigh Nichols, Belle Haven, Va.; Medical College of Virginia, Richmond, 1914; member of the Medical Society of Virginia; died in the Johnston-Willis Hospital, Richmond, Jan. 10, aged 66, of cerebral thrombosis.

Morgan, Everett Humphreys, Marion, Ohio; Starling Medical College, Columbus, 1903; veteran of the Spanish American War and World War I; served as county coroner; died at Westerville Feb. 11, aged 80.

Moseley, William Edward, Mount Savage, Md.; Baltimore Medical College, 1906; an associate member of the American Medical Association; died in Cumberland Nov. 21, aged 74, of cerebral hemorrhage.

Myre, **Stanley Lawrence,** Greybull, Wyo.; Marquette University School of Medicine, Milwaukee, 1915; veteran of World War I; died in Naples, Fla., Dec. 12, aged 65.

Proctor, Willis Herbert, Lynbrook, N. Y.; Hahnemann Medical College and Hospital of Philadelphia, 1880; an associate member of the American Medical Association; died in Long Island Feb. 13, aged 102.

Pruett, William Veasy, Washington, D. C.; Mississippi Medical College, Meriden, 1911; veteran of World War II; died in the Walter Reed Army Hospital, Jan. 11, aged 68, of pulmonary embolus.

Rabinovitz, Bernard ✱ Springfield, Mass.; Tufts College Medical School, Boston, 1913; also a registered pharmacist; veteran of World War I; on the staffs of the Springfield Municipal Hospital and the Springfield Hospital, where he died Feb. 13, aged 76, of cerebral hemorrhage, and coronary arteriorsclerosis.

Ragany, Joseph, Montrose, N. Y.; Magyar Királyi Pázmány Petrus Tudományegyetem Orvosi Fakultasa, Budapest, Hungary, 1921; service member of the American Medical Association; member of the American Psychiatric Association; veteran of World War II; on the staff of the Veterans Administration Hospital; died in the New York Hospital Jan. 10, aged 64, of pancreatitis.

Ranker, Emery Romain ✱ Oakland, Calif.; Northwestern University School of Medicine, Chicago, 1933; died Feb. 4, aged 60.

Rebok, Harry Edward, Keisterville, Pa.; Medico-Chirurgical College of Philadelphia, 1902; died in the Uniontown (Pa.) Hospital Feb. 3, aged 78.

Reed, Floyd Orton, Yonkers, N. Y.; Harvard Medical School, Boston, 1911; an associate member of the American Medical Association; veteran of World War I; for many years health service director and medical examiner for the city public schools; on the staff of the Professional Hospital; died Feb. 16, aged 73, of coronary thrombosis with arteriosclerosis.

Robinson, Louis Fred, Winnsboro, La.; Medical Department of Tulane University of Louisiana, New Orleans, 1906; served as Franklin parish coroner and parish health officer; died Jan. 18, aged 74, of congestive heart disease.

Robinson, William Witten ✱ Spokane, Wash.; Rush Medical College, Chicago, 1925; veteran of World Wars I and II; served on the staffs of the Deaconess, St. Luke's, and Sacred Heart hospitals; died in Honolulu, Hawaii, Feb. 5, aged 59, of heart failure.

Rodin, Robert, Urbana, Ill.; University of Illinois College of Medicine, Chicago, 1931; member of the health service staff, University of Illinois, where he was assistant professor of hygiene; died in the Research and Educational Hospitals, University of Illinois, Chicago, Jan. 5, aged 49, of leukemia.

Rogers, William Peyton ✱ El Paso, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1899; past-president of the El Paso County Medical Society; veteran of World War I; during World War II was on the Procurement and Assignment Board for the Army and Navy; for many years federal jail physician; on the staffs of Hotel Dieu, Sisters' Hospital, and Providence Hospital; died Jan. 20, aged 81.

Roosth, Harold ✱ Tyler, Texas; University of Texas School of Medicine, Galveston, 1940; member of the American Trudeau Society; interned at St. Vincent's Hospital in Erie, Pa.; served a residency at John Sealy Hospital in Galveston; state director of the Texas Tuberculosis Association in 1951; veteran of World War II; on the staffs of the Medical Center Hospital and the Mother Frances Hospital, where he died Feb. 7, aged 41, of intracranial hemorrhage.

Rosapepe, Attilio ✱ Youngstown, Ohio; Regia Università di Napoli Facoltà di Medicina e Chirurgia, Italy, 1911; veteran of World War I; formerly Italian consular agent for seven of the eastern Ohio counties; died in St. Elizabeth Hospital Jan. 28, aged 74, of arteriosclerosis.

Rusk, Francis Hubert, Alhambra, Calif.; Toledo Medical College, 1905; veteran of the Spanish-American War; died in the Veterans Administration Hospital in West Los Angeles Feb. 6, aged 87, of bronchopneumonia and arteriosclerosis.

Russell, Daniel Abell ✱ San Antonio, Texas; Tulane University School of Medicine, New Orleans, 1921; specialist certified by the American Board of Otolaryngology; member of the American Academy of Ophthalmology and Otolaryngology; on the staffs of the Santa Rosa and Nix hospitals; consultant, Brooke General Army Hospital and the Robert B. Green Hospital; died in the Santa Rosa Hospital Feb. 2, aged 61, of cerebral hemorrhage.

Sample, Roy Osborne ✱ San Antonio, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1913; member of the American Academy of General Practice; veteran of World War II; died in the Santa Rosa Hospital Dec. 2, aged 66.

Sanger, Winnie Monroney, Oklahoma City, Okla.; Kansas Medical College, Medical Department of Washburn College, Topeka, 1904; a dormitory at the University of Oklahoma had been named for her; chosen for the Oklahoma Hall of Fame; an associate member of the American Medical Association; died in Norman Feb. 7, aged 83, of bilateral bronchopneumonia.

Sapienza, Frank, New York City; George Washington University School of Medicine, Washington, D. C., 1924; member of the Medical Society of the State of New York; died Feb. 17, aged 60, of chronic myocarditis.

Schaeffer, Benjamin Leonard, South Chatham, Mass.; Columbia University College of Physicians and Surgeons, New York City, 1901; member of the Medical Society of the State of New York; an associate member of the American Medical Association; died in the Cape Cod Hospital, Hyannis, Feb. 17, aged 77, of ruptured aortic aneurysm.

Schilling, Francis M., Philadelphia; Jefferson Medical College of Philadelphia, 1909; member of the staffs of the Frankford and Jefferson hospitals; died in the Memorial Hospital, West Chester, Pa., Jan. 11, aged 81, of heart disease.

Schwager, Abraham Mark, New York City; University and Bellevue Hospital Medical College, New York City, 1911; an associate member of the American Medical Association; specialist certified by the American Board of Ophthalmology; member of the American Academy of Ophthalmology and Otolaryngology; on the staff of the New York Eye and Ear Infirmary; died in the Manhattan General Hospital Jan. 25, aged 76, of uremia and cerebral hemorrhage.

Scott, Clifton Russell ✠ New Haven, Conn.; Yale University School of Medicine, New Haven, 1919; specialist certified by the American Board of Radiology; member of the American Roentgen Ray Society and the American College of Radiology; associated with the Griffin Hospital in Derby and the Grace-New Haven Community Hospital; died Feb. 7, aged 65, of hypertensive heart disease.

Scott, James Edward, Jr. ✠ McClellanville, S. C.; Medical College of South Carolina, Charleston, 1937; member of the American Academy of General Practice; veteran of World War II; held the Bronze Star Medal, a Purple Heart Medal, and a Presidential Unit citation; died Feb. 7, aged 43, in an automobile accident.

Shahinian, Shahin Movses ✠ Philadelphia; Medico-Chirurgical College of Philadelphia, 1916; associated with the Lankenau Hospital, where he died Jan. 10, aged 75, of arteriosclerotic heart disease.

Sheehan, Edward Grady, West New York, N. J.; New York Homeopathic Medical College and Flower Hospital, New York City, 1919; died in the Berthold S. Pollak Hospital for Chest Diseases, Jersey City, Jan. 26, aged 63, of arteriosclerotic heart disease and pulmonary tuberculosis.

Sheets, Charles Henry ✠ Cozad, Neb.; John A. Creighton Medical College, Omaha, 1916; chairman of the board, First National Bank; on the staff of the Cozad Community Hospital; died Jan. 31, aged 62, of cancer.

Shininger, Paul Eugene, Lopez, Wash.; University of Oregon Medical School, Portland, 1931; formerly practiced in Portland, Ore., where he was on the staff of the Portland Sanitarium and Hospital; died Jan. 24, aged 53, of coronary thrombosis.

Shipley, Manly Harrison, Des Plaines, Ill.; Western Reserve University School of Medicine, Cleveland, 1915; died March 5, aged 70, of coronary thrombosis.

Silverstein, Jacob Maurice ✠ Millburn, N. J.; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1925; on the staff of the Irvington (N. J.) General Hospital; died in Port-Au-Prince, Haiti, March 3, aged 57, of coronary disease.

Silvey, Gordon E. ✠ Gadsden, Ala.; University of Tennessee Medical Department, Nashville, 1910; died Jan. 16, aged 72.

Simpson, Holland Breeding, Greensburg, Ky.; University of Louisville (Ky.) Medical Department, 1907; died Jan. 28, aged 75, of cerebral hemorrhage.

Sissakian, Avedis H., Verdel, Neb.; Northwestern University Medical School, Chicago, 1897; also a druggist; died in the Veterans Administration Hospital, Albany, Jan. 30, aged 91, of lymphatic leukemia.

Sloss, Imit Herman ✠ Terre Haute, Ind.; Meharry Medical College, Nashville, Tenn., 1911; died in St. Anthony Hospital Nov. 19, aged 71, of gangrene, and diabetes mellitus.

Smith, James Alonzo ✠ Sanford, Fla.; Chicago College of Medicine and Surgery, 1915; died in New Smyrna Beach Feb. 19, aged 69, of cerebral hemorrhage and arteriosclerotic heart disease.

Smith, Katherine Margaret Close, Louisville, Ky.; College of Physicians and Surgeons, Los Angeles, 1914; at one time practiced in Los Angeles, where she was on the staffs of the St. Vincent's Hospital, Los Angeles County Hospital and the Presbyterian Hospital–Olmsted Memorial; died in the Norton Memorial Infirmary Feb. 27, aged 68.

Smith, Matthew Mann, Detroit; Jefferson Medical College of Philadelphia, 1921; died in the Grace Hospital Dec. 25, aged 61, of cerebral thrombosis and arteriosclerosis.

Snyder, Malcolm Erwin, Senior Assistant Surgeon, U. S. Public Health Service Reserve, Everett, Wash.; University of Washington School of Medicine, Seattle, 1954; service member of the American Medical Association; interned at the U. S. Public Health Service Hospital in New Orleans; on the staff of the U. S. Public Health Service Hospital in Seattle; died Feb. 9, aged 29, of Hodgkin's disease.

Southard, Daniel B., Stanford, Ky.; Hospital College of Medicine, Louisville, 1898; served as health officer of Lincoln and Casey counties; died Jan. 18, aged 82, of myocarditis.

Sparks, Proctor, St. Petersburg, Fla.; University of Louisville School of Medicine, Louisville, Ky., 1917; member of the Kentucky State Medical Association; practiced in Ashland, Ky.; died Jan. 16, aged 66, of acute infarction of myocardium due to arteriosclerotic coronary thrombosis.

Sprague, Shirley Erving, New York City; University and Bellevue Hospital Medical College, New York City, 1899; an associate member of the American Medical Association; on the staff of St. Clare's Hospital; died Feb. 1, aged 82, of carcinoma of the lung.

Spurrier, Oliver Walter ✠ Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1929; veteran of World War II; on the staffs of the Mercy, St. Agnes, Bon Secours, Maryland General, Lutheran, and University hospitals; died Feb. 15, aged 52, of coronary thrombosis.

Srb, Joseph J., Dwight, Neb.; John A. Creighton Medical College, Omaha, 1915; veteran of World War I; served as president of the board of education; died Jan. 11, aged 70, of cardiac failure.

Stein, Ernst, Albany, N. Y.; Medizinische Fakultät der Universität, Vienna, Austria, 1906; died Jan. 20, aged 75.

Stennis, **Hugh Joseph** ✦ Abilene, Texas; University of Pennsylvania School of Medicine, Philadelphia, 1949; director of Abilene-Taylor County Health Department; veteran of World War II; killed in an automobile accident Jan. 16, aged 33.

Stevenson, **Hector Morrison,** West Hartford, Conn.; Long Island College of Medicine, Brooklyn, 1907; member of the Association of Life Insurance Medical Directors of America; an associate medical director of the Aetna Life Insurance Company; died in the Hartford (Conn.) Hospital Feb. 5, aged 70, of staphylococcal enteritis.

Stewart, **James Edward,** Akron, Ohio; Ohio State University College of Medicine, Columbus, 1916; died Jan. 30, aged 69, of cancer.

Stoner, **Donald Eugene,** New York City; University of California School of Medicine, San Francisco, 1949; resident physician at the Woman's Hospital; died Feb. 9, aged 31.

Stovall, **James Thomas,** Jefferson, Ga.; Medical College of Georgia, Augusta, 1930; part owner of the Commerce (Ga.) Hospital; died in the Emory University Hospital, Atlanta, Jan. 19, aged 50, of respiratory failure following operation for tumor of the brain.

Sullivan, **Elijah Stover,** Oklahoma City, Okla.; Barnes Medical College, St. Louis, 1910; an associate member of the American Medical Association; veteran of World War I; died in the Polyclinic Hospital Feb. 3, aged 70, of congestive heart failure and hypertensive and arteriosclerotic heart disease.

Sweeney, **William James,** Needham, Mass.; Tufts College Medical School, Boston, 1943; veteran of World War II; formerly an officer in the regular Navy; certified by the National Board of Medical Examiners; died Jan. 10, aged 37, of multiple sclerosis.

Tacey, **John Preston,** Grosse Pointe Shores, Mich.; Michigan College of Medicine and Surgery, Detroit, 1896; died Jan. 25, aged 92, of coronary thrombosis and arteriosclerosis.

Taylor, **James Thomas,** Pomeroy, Pa.; Jefferson Medical College of Philadelphia, 1890; an associate member of the American Medical Association; died in Honey Brook, Dec. 17, aged 90, of uremia.

Thomas, **Benjamin,** Oakland, Calif.; Medical Department of the University of California, San Francisco, 1901; an associate member of the American Medical Association; died Jan. 25, aged 86, of coronary thrombosis.

Thompson, **John James,** St. Petersburg, Fla.; University of Toronto Faculty of Medicine, Toronto, Ontario, Canada, 1907; specialist certified by the American Board of Psychiatry and Neurology; service member of the American Medical Association; formerly associated with Veterans Administration hospitals in Boston, Bedford, Mass., Hines, Ill., and Danville, Ill.; retired from the Veterans Administration Oct. 31, 1949; died Jan. 2, aged 77, of coronary thrombosis.

Trostler, **Isador Simon** ✦ Chicago; University of Nebraska College of Medicine, Omaha, 1904; specialist certified by the American Board of Radiology; member of the American College of Radiology; fellow of the American College of Physicians; died March 10, aged 87, of hypostatic pneumonia and arteriosclerotic heart disease.

Turner, **Steve F.** ✦ El Paso, Texas; University of Texas School of Medicine, Galveston, 1935; died Feb. 4, aged 45.

Turnipseed, **Maxy Leander,** Sallis, Miss.; University of Nashville Medical Department, 1900; died Feb. 19, aged 87.

Twomey, **George Watson,** Fort Myers, Fla.; University of Louisville (Ky.) Medical Department, 1903; died in the Lee Memorial Hospital Nov. 25, aged 76, of cor pulmonale.

Upham, **Roscoe Charles,** Biddeford, Maine; Baltimore Medical College, 1908; member of the Maine Medical Association; died March 15, aged 72, of a heart attack.

Vermilyea, **Charles Herbert** ✦ Russell, Pa.; Baltimore Medical College, 1897; on the staff of the Warren (Pa.) General Hospital, where he died Feb. 16, aged 85.

Walker, **Robert Latshaw III** ✦ Homestead, Pa.; Jefferson Medical College of Philadelphia, 1940; veteran of World War II; died in the Western Pennsylvania Hospital, Pittsburgh, Nov. 3, aged 48.

Wharton, **Ralph Eugene** ✦ Mansfield, Ohio; Western Reserve University School of Medicine, Cleveland, 1933; member of the American Academy of General Practice; veteran of World War II; on the staff of the Mansfield General Hospital; died in Houston, Texas, Feb. 19, aged 49, of cerebral vascular accident.

Williams, **Maud Rose M.,** Washington, D. C.; Wisconsin College of Physicians and Surgeons, Milwaukee, 1907; veteran of World War I; died in the Central Dispensary and Emergency Hospital, Feb. 20, aged 78, of carcinoma of the breast.

Woodworth, **Marshall Melvin** ✦ Albany, Ore.; University of Oregon Medical School, Portland, 1923; veteran of World War I; president of the board of directors of the Albany General Hospital; past-president of the Albany Rotary Club; died Feb. 21, aged 63, of an accidental gunshot wound while cleaning his gun.

Yarrington, **Charles Webb** ✦ Gary, Ind.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1902; fellow of the American College of Surgeons; past-president of the Lake County Medical Society; on the staffs of the Mercy and Methodist hospitals; past-president of the Gary Rotary Club; died in Clearwater, Fla., March 25, aged 80, of a heart attack.

Young, **John Hichnor,** Montclair, N. J.; New York Homeopathic Medical College and Hospital, New York City, 1906; served on the staffs of the East Orange (N. J.) General Hospital, Mountainside and Montclair Community hospitals; died in Southern Pines, N. C., Feb. 24, aged 77.

Zupnik, **Howard Lester** ✦ Baltimore; University of Maryland School of Medicine and College of Physicians and Surgeons, Baltimore, 1932; veteran of World War II; consultant, Mercy Hospital; died Feb. 15, aged 51.

FOREIGN LETTERS

AUSTRIA

Rare Injuries of Muscles, Tendons, and Periosteum.—At the meeting of the Vienna Medical Society on March 1, H. Schönbauer stated that functional impairment of muscles and tendons is usually caused by the passive stretching of a muscle with maximal tension. Persons who are not physically trained or who are insufficiently warmed up in bad weather and aged athletes with degenerative manifestations in the tendons are likely to incur such injuries. Damage to the sternocleidomastoideus muscle in wrestlers and erector spinae in hurdlers, divers, and pole vaulters need no specific treatment. Major ruptures of the abdominal wall, caused by pushing and throwing during gymnastics and boxing, must be sutured. Ruptures of the pectoral muscles and of the long biceps tendon, caused by throwing, wrestling, and weight-lifting and tearings off from the insertion of the triceps in fencers and throwers, occur. These ruptures must be sutured. Rupture of the extensor tendon in fingers occurs during ball playing and ruptures of the bending tendon during tug-of-war. A tearing off from the anterior superior iliac spine is a common occurrence in juvenile runners. Ruptures of the adductor and gastrocnemius muscles are therapeutically unimportant; those of the quadriceps tendon, common in football players and ice skaters, must be sutured; and those of the tendo achillis, common in football and tennis players, are becoming increasingly frequent in skiers.

Ocular Injuries in Athletes.—At the same meeting, K. Safar said that, because myopic athletes are particularly susceptible to ocular injuries, this condition should be especially looked for in the medical examination of athletes. About 5% of detachments of the retina are due to athletic exercises. Persons with a tendency to retinal detachment may be allowed to swim but not to dive. Before a rational operation for retinal detachment had been devised, a well-known diver became blind in one eye because of retinal detachment. She did not give up diving, despite warnings, and became blind also in the other eye.

Electrocardiographic Changes Associated with Cardiac Hypertrophy.—At the same meeting, L. Slapak stated that changes in the electrocardiogram may occur in well-trained athletes. The differential diagnosis between these changes and those of pathological origin may be difficult. The most important of these changes are a prolongation of the PQ interval of more than 0.2 second and a prolongation of the relative QT interval. These changes are observed with the patient at rest. When an extra load is placed on the heart, the tracings become normal and even subnormal measurements may be found. A sure diagnosis of a cardiac lesion can be made only after placing a heavy extra load on the heart. The loading test must be carefully performed. A decrease in the ST interval of 0.1 to 0.15 mv. is observed in young persons after exertion, but this is not considered abnormal if the interval returns to normal after a short time. Changes in the T waves in athletes may consist of a primary decrease noted immediately after a slight extra load which lasts only for a few minutes and does not recur with a moderate or heavy extra load. The one-minute peak after a one-minute overload and a so-called secondary decrease can be observed three to five minutes after an extra load. This parallels the degree of cardiac fatigue. It may be observed after a moderate or heavy overload placed on the heart of untrained persons and indicates that the limit of tolerance has been reached. Its occurrence can be delayed by training. Higher amplitudes with chest wall leads and a physiological incomplete right bundle-branch block may be observed in well-trained athletes. This is not an abnormal sign. Likewise, severe bradycardia, temporary Tawara's rhythm, or transitory atrioventricular dissociation may occur on a purely physiological basis in athletes.

Cytological Diagnosis.—At the meeting of the Austrian Gynecologic and Obstetric Society in March, H. Kremer said that the reliability of Papanicolaou's cytological test depends on the care used in taking the smear and on the medical experience of the examiner. The accuracy of early diagnosis of cervical cancer and of uterine cancer in situ was proved in 88.2% of the 10,688 patients who were examined by this method between September, 1954, and June, 1956. The two years were subdivided into three periods, with the same number of patients in each period. The per cent of an accurate early diagnosis (84.8%, 86.6%, and 93.7%) showed a steady increase. According to the results, cytology proved to be valuable for detecting cervical carcinoma. The use of cytology by the practitioner is recommended, since only a precise technique in securing the smear is required. The smear itself must be examined by an experienced cytologist.

Vitamin B_6 Levels in Patients with Carcinoma.—At the meeting of the Austrian Society for Gynecology and Obstetrics in February, O. Seeliger stated that the vitamin B_6 levels in the blood and tissue of normal mice and of those with carcinoma are significantly different. Similar studies in man have not been reported. Vitamin B_6 determinations in man had previously been made only in the feces and urine. It was possible to determine the vitamin B_6 level in the blood of healthy women and of those with carcinoma only after a slight modification of the method of microbiological determination of Atkins and co-workers. They used Saccharomyces carlsbergensis 4228 as a bioassay organism for vitamin B_6 determination in the blood of monkeys. The determinations of the vitamin B_6 level in the fasting blood of healthy women and of those with carcinoma of the sex organs did not show significant differences. A second group of patients was

The items in these letters are contributed by regular correspondents in the various foreign countries.

given 50 mg. of vitamin B_6 intravenously, and the changes of the vitamin B_6 level in the serum were determined after 5, 15, and 30 minutes and 1, 2, and 24 hours. The highest values of vitamin B_6 were obtained after 5 and 15 minutes, respectively, whereas the main portion of the injected vitamin B_6 had disappeared almost entirely after two hours. After 5 to 15 minutes, the vitamin B_6 levels in the diseased women were significantly lower than those in the healthy women.

Properdin Titer.—At the meeting of the Austrian Society for Microbiology and Hygiene in Vienna in March, Dr. W. Auerswald, of the Vienna University, reported on the effects of polypeptides of low molecular weight on the properdin titer of rabbits. His preparation, which had been proved nonantigenic and phagocytosis-stimulating previously, induced, after intramuscular administration in doses of 2 mg., an increase of the properdin titer from 8 units per milliliter of serum up to 64 units per milliliter. After 48 to 72 hours, the properdin level returned to the initial reading. It is assumed that, contrary to lipopolysaccharides which are antigenic, this polypeptide preparation might be useful for stimulating the properdin system without antigenic side-effects.

BRAZIL

Stellate Ganglion Block in Vascular Diseases of the Brain.—Dr. A. Figueiredo reported to the Associacão Paulista de Medicina on 340 patients with nonhemorrhagic symptoms of acute vascular accidents of the brain in whom he had performed a stellate ganglion block. Of these patients, 256 had symptoms of cerebral thrombosis without complications, 30 had a history of cerebral thrombosis complicated by cardiac decompensation or by diabetes, and 54 showed signs of cerebral embolism. In all cases a 1% solution of procaine was injected through the anterior route. The minimum time elapsed between the onset of the vascular accident and the first block was two and one-half hours and the maximum time was three days. The block was repeated in each patient at least 10 times. On the first day it was repeated every four hours and after that twice daily. The results obtained after the 1st and the 10th blocks were evaluated in relation to the motor recuperation and the mental behavior of the patient. The results were better in patients in whom the infiltration was done during the first hours after the onset of the symptoms. Of the 40 patients treated in the first 8 hours, 72.5% after 1 block and 85% after 10 blocks were benefited; of the 57 treated after 9 to 16 hours, 70.1% after 1 block and 77.1% after 10 blocks were benefited; of the 55 treated after 17 to 24 hours, 38.1% after 1 block and 54.5% after 10 blocks were benefited; and of the 188 treated after 25 hours, only 22.7% after 1 block and 29% after 10 blocks were benefited. Thus 162 patients, or 48%, showed some improvement after 10 blocks. The best results were obtained in patients with thrombosis without complication (improvement in 121 of 256 cases, or 47.3%) and in those with cerebral embolism (improvement in 41 of 54, or 75.9%).

The patients with thrombosis complicated by diabetes and those with cardiac insufficiency did not respond to the treatment. Thus, of 30 such patients, in 2 there was only slight improvement and in 21 the symptoms were unchanged; 7 died during the treatment. In 42 patients, an electroencephalogram was obtained, and in all of them before the first block it revealed slow waves of low potential in the damaged hemisphere. In 14 patients an electroencephalogram was again obtained three to five hours after the block, and in 12 of these the slow waves had disappeared. In the remaining 28 the electroencephalogram was repeated after the 10th block. In only 2 patients was there an increase in the blood flow, but clinical improvement was observed in 10. Stellate ganglion block gives good results in patients with acute vascular accidents of the brain without hemorrhage or the complication of diabetes or cardiac insufficiency.

Penicillin in Dementia Paralytica.—Dr. A. B. Fortes (*O Hospital* **50**:645, 1957) states that he treated three groups of 30 patients with dementia paralytica. The patients of the first group were given malariotherapy followed by penicillin and showed an improvement rate of 50%. Those of the second group were given 1 million units of procaine penicillin G daily for 10 days and showed the same rate of improvement. Those of the third group were given 2.4 million units of benzathine penicillin G on the first, fifth, and ninth days plus 500,000 units of potassium penicillin G, every 12 hours, or a total of 17.2 million units in 10 days. This schedule gave an improvement rate of 83.3% and significant improvement in the serologic and spinal fluid findings. The patients treated with penicillin shortly after the diagnosis was established showed appreciable improvement, becoming quieter, less delirious and less agitated. Their body weight also increased. The author believes that treatment with penicillin is superior to malariotherapy and that the relative efficacy of the different forms of penicillin should be evaluated.

Restaurant Sanitation.—In 1947, Dr. D. A. Christovão examined the sanitary conditions of 1,568 eating and drinking utensils of restaurants in the central area of the city of São Paulo. Only 14% of the coffee cups and one lot of glasses from restaurants were considered satisfactory (maximum of 100 bacteria per utensil). The large number of bacteria present on all types of utensils and the large percentage of lots in which pathogenic organisms were found, as well as the number of lots from which Escherichia coli were isolated, revealed the existence of a great sanitation problem. In a new survey (*Revista paulista med.* **49**:385, 1956), the author has found practically the same situation. This is especially deplorable in view of the fact that many other activities of the São Paulo State Health Department have shown great progress in the last decade.

FINLAND

Operation for Sciatica.—Dr. E. V. S. Koskinen (*Annales chirurgiae et gynaecologiae Fenniae*, supp. 3, vol. 46, 1957) made a follow-up examination of 104 patients

with sciatica in whom herniation of the nucleus pulposus was treated surgically. Not counting earlier attacks of sciatic and back pain, all patients had had on admission continuous pain in the leg of at least one year's duration (average 26 months.) All the patients showed distinct lesions of the nucleus pulposus. The occupation of 67 involved hard work, that of 20 semihard manual work, and that of 17 light work. The postoperative follow-up period was one to five years. It was found that the pain syndrome with simultaneous onset in the back and leg occurred most commonly as a consequence of trauma. In this series, 41% were completely cured, 45% were sufficiently improved to resume work, and 14% continued to suffer from sciatica. Leg pain disappeared entirely in 60% of the patients, and in 26% slight and intermittent pains occurred. Back pain was completely relieved in 46%; slight intermittent back pain remained in 36%; and continuous back pain persisted in 18%. Restricted flexibility of the back, a constant symptom prior to admission, persisted in 19% of the patients. The percentage with scoliosis had dropped from 78 to 5. In patients with areflexia the return of the reflexes was slow.

Otological Rehabilitation.—A research section for rehabilitation of the disabled has been organized in connection with the Institute for Occupational Health on the initiative of the Ministry for Social Affairs. A total of 1,472 disabled persons were examined there in a little over three years; of those, 219 (15%) required an otological examination. They were classified by J. S. Lumio according to their disability (*Duodecim*, no. 1, 1957) in the following manner: 1. Persons whose principal disability was hearing loss. Forty-seven persons, or 3.2% of all disabled persons, were in this group. Of these, 26 were completely deaf and 21 severely hard of hearing. 2. Persons whose principal disability was something other than hearing loss but whose hearing loss was definitely disabling. This group consisted of people who were severely hard of hearing or unilaterally deaf. 3. Persons whose principal disability was something other than hearing loss but whose hearing was depressed, though not to the degree of causing disability. There were 93 persons in this group. 4. Disabled persons whose hearing was found to be normal on examination or became normal after treatment. There were 49 in this group.

Further analysis revealed that of the total series 11.5% had hearing loss and 5.2% (66) were deaf or severely hard of hearing. Of those suffering from chronic otitis media, 17 required medical attention, and 2 of those were advised to undergo a radical mastoid operation. Of those who were deaf and severely hard of hearing, 3 spoke intelligibly; 27 indistinctly, though the meaning could be understood; and 9 so indistinctly that no meaning could be made out. Fourteen persons were excellent lip readers and 9 knew little or no lip reading; 27 disabled persons used a hearing aid, and 20 others were fitted with hearing aids. Speech training was recommended to 3 persons, and occupational training was required by 120.

Pulmonary Vascular Changes Associated with Patent Ductus Arteriosus.—Landtman and Hjelt (*Annales Paediatriae Fenniae*, vol. 3, part 1) reported on a series of 23 children with patent ductus arteriosus. Lung biopsy specimens were taken at the operation before ligation of the ductus. Similar specimens obtained at autopsy from 100 children who had died of causes unrelated to the heart or lungs served as controls. All the patients with patent ductus arteriosus revealed histological changes suggestive of pulmonary arteriosclerosis. These changes, which were confined to the small arteries and arterioles, consisted mainly of medial hypertrophy, intimal proliferation, and thickening of the tunica adventitia. The lesions usually caused narrowing of the arterial lumen. Alveolar fibrosis was occasionally seen. Similar pulmonary vascular changes were not encountered in the control group. There was no correlation between the degree of the histological changes and the clinical data on the patients. These observations support the opinion that all patients with patent ductus arteriosus should be operated on regardless of the severity of the symptoms and clinical signs.

ITALY

Neuroradiologic Congress.—The Italian Neuroradiologic Congress was held in Modena in March. Dr. Decker, of the Neurologic Clinic of the University of Munich, Germany, demonstrated a new pneumoencephalographic technique. The modification consisted in the fact that the air, introduced by spinal puncture, is followed fluoroscopically in its passage through the subarachnoid spaces and the ventricular cavities of the brain. An amplifying electronic device is used to enhance the brightness of the screen, which is looked at through a binocular system. Spot films are taken when desired. A cineroentgenographic film of the screen may be made, with 50 frames a second being used. The fluoroscopic control of pneumoencephalography has proved advantageous in that there is greater certainty of filling the ventricular system; it is not necessary to develop the films to ascertain the location of the air; films may be taken when the air lies in the desired spot; and the examination may be interrupted if a cerebellar pressure cone should develop.

Dr. Di Chiro, of Naples, presented a case thought to be the first one to be reported of retinocerebellar angiomatosis combined with deep cervical angiomas. A 26-year-old man, blind since the age of 16, was hospitalized with signs of increased intracranial pressure, ataxia, and severe radicular pain in the left upper extremity. Typical retinal angiomatosis was found. A roentgenogram of the skull showed calcification of the walls of both eyeballs. Left vertebral angiography revealed at least two angiomatous formations in the posterior fossa and two angiomatous sacs embedded deeply in the cervical region at the level of the third vertebral body. Carotid angiography failed to reveal any supratentorial vascular anomalies. The intense radicular pain in the left upper extremity was believed to be caused by the cervical angiomas pressing on the nerves of the brachial plexus.

Drs. Di Chiro and Catapano presented the results of a pneumoencephalographic study of 18 patients with dementia paralytica. Dilatation of the ventricular system and/or of the subarachnoid spaces, the former

a sign of central atrophy, the latter a sign of cortical atrophy, was found in all patients. Dilatation was always bilateral; this is considered an important feature of the pneumoencephalogram in patients with dementia paralytica. The pneumoencephalogram in these patients is fairly characteristic. In one patient suspected of having an intracranial neoplasm, the pneumoencephalogram was characteristic of dementia paralytica, and this diagnosis was eventually confirmed. The pneumoencephalogram is of great diagnostic value in borderline cases of dementia paralytica. Furthermore, concomitant lesions, as in one of the authors' patients with a subdural hematoma, may be discovered by means of a pneumoencephalogram. Dilatation of the ventricular system was more frequently found in older patients, whereas a high degree of widening of the subarachnoid spaces has been proved to be related to advanced mental deterioration, regardless of the patient's age. The relation between age and dilatation of the ventricular system and between mental deterioration and widening of the subarachnoid spaces, proved by the authors in patients with dementia paralytica, is believed to be a general rule. The pneumoencephalogram in aged patients who have retained their mental functions shows only enlarged ventricles in most cases. The hydrocephalic child with enormous ventricular dilatation is often surprisingly active. On the contrary, the subarachnoid spaces are found to be markedly widened in patients with senile and presenile dementia and in those with dementia paralytica.

PERU

Cerebral Metastasis from Lung Cancer.—Lung cancer is the malignant tumor that gives rise to the largest incidence of cerebral metastasis. Ten cases of bronchogenic carcinoma with cerebral metastasis are reported by Jerí and Landa (*Revista de neuropsiquiatría*, vol. 19, no. 2, 1956). Four of the patients complained of respiratory and six complained of neurological symptoms. Their ages ranged from 36 to 64 years; nine were men and one was a woman. Six were heavy smokers. The respiratory symptoms were cough, with or without sputum, and thoracic pain. The six patients complaining of neurological disturbances had little, if any, respiratory distress. On radiologic examination signs of intracranial expanding lesions and of lung tumor were detected in all of the patients. In seven patients cytological study of bronchial secretion followed by bronchoscopy was made. In four of these the former procedure and in five the latter confirmed the diagnosis. The neurological changes induced by the cerebral metastasis were headache in eight patients, convulsions in six, motor changes in eight, papilledema in six, and various degrees of cerebral amnesia in seven. The changes were noted from 10 days to 6 months before consultation and in most patients had developed rapidly. Laboratory studies were of little help in the diagnosis of the cerebral lesions. The electroencephalogram was normal in three of five patients thus studied. Nine patients died, most of them within 90 days after confirmation of the diagnosis. Craniotomy was attempted in five, but four died shortly after the operation. Six were treated by roentgenotherapy; only one of these was still alive at the time of writing. The authors stress the importance of early diagnosis and complete removal of the primary lesion before metastasis occurs.

Shock Therapy and Adrenal Function.—In an attempt to clear up the status of the adrenal function of psychiatric patients, specially in those undergoing shock therapy, investigations on the uropepsin excretion, as an indirect index of adrenal function, were reported by M. Vargas in the same issue. Hourly determination of this enzyme was made in 46 patients suffering from diverse neuropsychiatric conditions other than schizophrenia and in 45 schizophrenic patients. All the patients were men. In those with schizophrenia and chronic alcoholism the average levels of uropepsin were found to be somewhat lower than normal. In those with manic-depressive psychosis the uropepsin excretion proved to be higher during the manic and lower during the depressive phase. In most patients electroshock stimulated the adrenal cortex, and the uropepsin excretion more than doubled. The hypoglycemia induced by insulin also acted as a powerful stressor agent, since in almost all of the patients in a coma the uropepsin excretion rate rose to 132% over the basal figure. The uropepsin excretion reached the highest levels in the first four hours after insulin injection and then began to drop slowly. Late in the course of the treatment, after several applications of shock therapy, the stimulating effect on the uropepsin excretion shows marked diminution. Combined treatment with electroshock and insulin increases the uropepsin excretion, even in those patients in whom only one type of therapy no longer results in cortical stimulation. The author concludes that (1) the adrenals of the schizophrenic do not react in the same way as those of the normal subject; (2) hypofunction of the whole gland cannot yet be inferred; (3) it is more likely that some functions are diminished, some increased, and some unchanged; and (4) the basic physiological modifications of the adrenals in schizophrenia may be represented by qualitative disturbances in the steroidogenesis, though quantitative changes cannot be ruled out.

Mammary Cancer.—Dr. Bedoya Hevia M. advocates the performance of radical mastectomy followed by roentgenotherapy in the treatment of mammary cancer (*Ginecología y Obstetrica*, vol. 4, no. 2, 1956). He believes that the more extensive operation requires further trial and long-term evaluation before being adopted in the routine management of this disease. In suitable cases needle biopsy is routinely made on the day before operation. Its performance does not prejudice the prognosis and may make the treatment safer. If positive, radical mastectomy is carried out on the following day. If negative, a frozen biopsy specimen is obtained with the patient under anesthesia, and a radical mastectomy is performed if the histological examination reveals cancer. Blood transfusions are mandatory during the operation. In a series of 54 patients, radical mastectomy was followed

by roentgenotherapy in 50 and in the remaining 4 simple mastectomy and roentgenotherapy were used. Of the 50 patients, 21 survived for five years or more, axillary metastases being present, however, at the time of report in 13 of them. The extended operation in which the supraclavicular lymph nodes are removed is not advised by the author, because the presence of metastases in these nodes constitutes a contraindication for radical mastectomy. As to mastectomy with resection of the internal mammary chain of lymph nodes, the author believes that further experience is needed in order to determine its real value and precise indications. In the elderly patient who is a poor surgical risk, as well as in the patient with an ulcerated tumor, the author recommends simple mastectomy as a palliative measure. When isolated recurrences take place, they are surgically removed and roentgenotherapy is applied. The author has performed an oophorectomy in some of these patients with encouraging results.

Cancer of the Uterine Cervix.—At a meeting of the Peruvian Society of Obstetrics and Gynecology in October, Dr. Estevez L., of the National Institute of Neoplastic Diseases, said that pelvic exenteration in selected cases of cancer of the uterine cervix goes beyond being a palliative measure and is definitely curative. Of his series of 14 pelvic exenterations, 13 were total and 1 was of the anterior type. The operative mortality was 30.7%. Eighteen months after the operation, nine patients, including the one operative death, had died. Drs. Majluf T. and Napoleón Mattos R., of the same institute, reported on a series of 1,224 patients treated by irradiation. Of those, 19.2% could not be followed. Of the remainder, 49.5% died within four years; 43.5% survived over five years, 41.0% over six years, and 34.2% over eight years.

Obstetric Anesthesia.—At the same meeting, Dr. Lozano Pardo reported on 120 patients who underwent anesthesia and analgesia during labor. He tried three different mixtures: (1) chlorpromazine hydrochloride, meperidine hydrochloride, and promethazine hydrochloride; (2) chlorpromazine, meperidine, and scopolamine; and (3) chlorpromazine, pyrazolonic derivatives, and promethazine. The best analgesic effect was elicited by the second mixture, but the first proved to have the best sedative action. The results obtained with the third mixture were poor.

Eclampsia.—At the same meeting, Dr. Bazul M. and co-workers, of the Faculty of Medicine, described two patients with eclampsia in whom an abnormal increase of the blood levels of estrogens as well as a decrease of the serum calcium levels were detected. He suggested the possibility that the hypocalcemia and the attendant syndrome of tetany in pregnancy are likely to be caused by a parathyroid dysfunction, the excess of estrogens of placental origin tending to diminish further the serum calcium levels. Drs. Villamón F. and Valiente Preciado H. advocated the "lytic cocktail" given intravenously in isotonic dextrose solution in the treatment of eclampsia. Dramatic clinical response often occurs 24 to 48 hours after this therapy is started.

UNITED KINGDOM

Brucellosis in Children.—Although brucellosis is a relatively rare condition in Great Britain, Wallis, scrutinizing the records of 2,000 hospitalized children seen personally, found 10 cases, most of which presented diagnostic puzzles and in three of which diagnosis was made in retrospect (*Brit. M. J.* **1**:621, 1957). All the patients, most of whom came from rural districts, had drunk unpasteurized milk, although in some cases it was from tuberculin-tested herds. Some of the patients were town dwellers who became infected during a summer vacation in the country. The chief manifestations of the disease were pyrexia; enlargement of the liver, lymph nodes, and spleen; arthritis; epistaxis; chronic abdominal pain; headache; constipation; and albumin or pus cells in the urine. An erroneous diagnosis of psychoneurosis was sometimes made. Wallis points out that agglutination and skin tests may be negative while the disease is still active, and hence the diagnosis may have to be made on clinical grounds alone. He states that the best method of prophylaxis is to eradicate the disease from cattle by inoculation of calves with a vaccine of attenuated Brucella abortus strain 19. Until this is done the second line of defense is compulsory pasteurization and compulsory reporting so that health officers can trace outbreaks of the disease. The threat of legal proceedings against the distributors of infected milk and the owners of infected herds should stamp out the disease.

Pituitary Implants of Radioactive Gold and Yttrium.—Symptomatic improvement or even arrest of mammary and prostatic carcinoma occurs in some patients after removal or destruction of the adenohypophysis. One method of destruction is to introduce a radioactive isotope into the pituitary gland through a cannula passing through the nose and the sphenoidal sinus. Stretton Young described the structural changes in the pituitary after the implantation of radioactive isotopes of gold and yttrium (*Lancet* **1**:548, 1957). Pituitaries were obtained at autopsy from patients who had previously received radioactive pituitary implants for mammary or prostatic carcinoma. Irradiation varied from periods of 31 hours to 150 days. In no case did the implants cause complete necrosis of the pituitary. A minimum of about 70,000 r of gamma-irradiation appears to be necessary to cause necrosis in most parts of the gland, and cells adjacent to the capsule and those around blood vessels are more resistant to radionecrosis than those elsewhere. Chromophobic, eosinophilic, and basophilic cells appear to be equally susceptible to the necrotizing effects of beta and gamma-irradiation. On the basis of absence of mitotic activity there is no evidence of regeneration after irradiation.

Growing Life Expectancy.—The life tables volume of the Registrar General's Decennial Supplement for England and Wales, 1951, now published, shows that the life expectancy of a boy at birth has increased by nearly 15 years in the past 40 years; for a girl, the increase is more than 16 years. In 1910 to 1912, 120 of every 1,000 boys born and 98 of every 1,000 girls born died before reaching their first birthday. The corresponding figures

for 1950 to 1952 were 33 boys and 25 girls. The longevity of women has increased more than that of men. At age 60, for instance, the life expectancy in 1950 to 1952 for men was about 14¾ years, an increase of only ¾ year on the figure of 20 years earlier, whereas for women the life expectancy was 18 years, an increase of 1½ years in this period. Persons living in England have a higher life expectancy than those living in Scotland or Wales. In rural areas the mortality, particularly for men, is much lower than the national average.

Deaths from Tuberculosis and Cancer.—Provisional figures for deaths in England and Wales, in 1956, issued by the registrar general, show that the total number of deaths from respiratory tuberculosis was 4,851, compared with 5,837 in 1955, giving a death rate of 109 per million persons. This is a decrease of 17% compared with the previous year, and means that, since 1947, the death rate from respiratory tuberculosis has fallen by more than 75%. The provisional death rate from all forms of cancer for men was 2,274 per million population and 1,891 for women; the 1955 figures were 2,252 and 1,873 respectively. The rise in the rate for men includes an increase from 693 to 726 per million population for deaths from cancer of the lung and bronchus. The corresponding rate for women increased from 106 per million in 1955 to 111 in 1956.

Mental Disease Statistics.—In the annual report of the Institute of Psychiatry of the University of London, an examination of the records of 11,000 mental patients is discussed. Of the 9,000 patients admitted to observation units, just over 25% recovered quickly from short-lived disturbances, so that after two or three weeks they were able to return home. Of those admitted, 7% died in the observation units. Many of these were suffering from a confusional state, delirium, or other mental disease accompanying the later stages of physical disease. From the first admission rates, it is calculated that, of every 1,000 babies born, 53 will be admitted at least once in their life to a mental hospital; 10 of these will suffer from schizophrenia, 11 from manic-depressive and involutional psychoses, 24 from psychoses of old age, 2 from organic psychoses (excluding cerebral arteriosclerosis), and 6 from other mental disorders. The first admission rates also show a striking difference in regard to the marital status of the patients. In the group of men aged between 30 and 49 years, the number of first admissions per million was 1,455 (±196) for single men and 299 (±38) for married men; the corresponding figures for women were 1,262 (±173) and 536 (±52). Moreover, single persons stayed in hospital for longer periods than married persons. In brief, single persons were found to be more likely than married persons to enter mental hospitals, and, once in, they were less likely to reach the point at which they could be discharged.

Enteritis from Tortoise.—M. E. M. Thomas (*Month. Bull. Min. Health* **16**:29, 1957) reports that in May, 1955, a Moroccan tortoise was introduced into a household in which there had been a pair of tortoises for the preceding two years. Within a month the condition of the two older tortoises had deteriorated and they suffered loss of appetite, and all five children in the household suffered from acute enteritis. The new tortoise was found to be heavily infected with a salicin-fermenting paracolon organism resembling Salmonella paratyphi B. Feces were not examined until two weeks after the illnesses, but the tortoise type of paracolon bacillus was then isolated in pure culture from one child who was 18 months old. The organism was probably an atypical member of the Arizona group.

Fats and Coronary Thrombosis.—In a paper read before the Manchester Medical Society, Dr. J. N. Morris, the director of the Medical Research Council's social medicine research unit, stated that he was unable to trace any correlation between mortality from coronary heart disease and trends in fat consumption. In his view, the marked variations in the mortality in western countries with comparable high-fat intakes were in accordance with the suggestion that total fat consumption was the critical factor. Changes in the consumption of animal fat in Great Britain in the present century could be related to changes in the incidence of coronary atheroma as recorded at the London Hospital, but they showed no relation to the registrar general's figures on mortality from coronary heart disease. The trend of consumption of butterfat in Great Britain showed less than no relation, as indicated by the steep increase in the number of coronary deaths since 1943. Changes in the intake of vegetable fats showed a closer relation to the mortality, and changes in intake of hydrogenated fat showed a still closer relation, except that the distribution of coronary mortality by social classes was not in accordance with the class pattern of margarine intake. International evidence is even more contradictory. In Norway, where there is high consumption of margarine, there seem to be fewer cases of fatal coronary thrombosis than in New Zealand where little margarine is eaten. Are the Norwegians protected by eating fish? If so, this does not explain why Aberdeen reported twice the coronary death rate of Oslo. In terms of total essential fatty acids, the only available data for Great Britain give no support to the hypothesis that the population is now suffering from an absolute or relative deficiency of these nutrients. One possible explanation of the apparent anomalies of the present moment is that several dietary factors may be involved or that diet is only one of several causes of ischemic heart disease.

Plastic Transfusion Sets.—The use of plastic instead of rubber tubing has reduced the incidence of thrombophlebitis by about 50%, according to a report to the Medical Research Council (*Lancet* **1**:595, 1957). The tubing used in the trials was made of polyvinyl chloride with added plasticizer and stabilizer. In a comparable control series, the standard rubber sets supplied by the National Blood Transfusion Service were used. Among the infusions lasting more than 12 hours, reactions occurred in 32% of those with the plastic sets and in 56% of those with the rubber sets. The percentage of severe and moderately severe reactions was 18 for those with the plastic sets and 34 for those using the rubber sets. The incidents and severity of thrombophlebitis increased appreciably with the length of the infusion for each set. The superiority of the plastic set was apparent in each of the groups studied.

THE LEISURE CORNER

GARDENING AS A HOBBY

One of the more agreeable consequences of pursuing the suburban way of life is to be found in the garden. A garden is sensitive to the will of the caretaker; it has to meet the needs and the taste of the person who undertakes the responsibility for its care. The physician who cultivates gardening as a hobby will find it both an art and a science, as well as a healthful and delightful outdoor activity.

In gardening, soil management is, first of all, of the utmost importance. Soil should be prepared with one of the animal manures, rot from stables or fecal matter from the chicken, sheep, or cow. This should be thoroughly worked into the soil and can be used at the rate of 1 lb. for every 3 sq. ft. Most garden soils are comprised of five intermingled components: mineral substances obtained from the slow disintegration of rock surfaces; humus or decaying organic matter; large quantities of minute living organisms such as bacteria, protozoa, and fungi; water, which holds in solution the dissolved mineral salts; and air.

Experts on gardening point out that fall is the best time to remodel a garden. As summer dissolves into autumn, there is a noticeable feeling of change taking place in the garden. Overcrowded iris or day lilies require digging or division, delphinium must be moved to sheltered spots, and storm-damaged trees must be repaired or thinned. Also there are shrubs to be planted, there is a lawn to be redone, and there are fences to be built or paths to be paved.

Almost every gardener takes pride in the beauty of his lawn. Unfortunately, too many people fail to recognize that a lawn is not a matter of temporary planting —on the contrary, it is a matter of permanent planting. An adequately prepared lawn, one planted for posterity, may be as permanent and luxuriant as the trees that cast their shade over it. Many lawns that surround the attractive manor homes of England were actually planted more than 500 years ago. In creating a successful lawn, provision should be made for adequate preparation of the soil before planting, selection of proper seed, and sowing, watering, and rolling. Most home owners desire a lawn of luxuriant green turf which will withstand a reasonable amount of wear and can be maintained with a minimum expenditure of time and money. Kentucky bluegrass will meet these requirements more completely than any other type of lawn grass under average conditions of care and maintenance. However, Kentucky bluegrass has several definite requirements for satisfactory growth. It prefers a moderately cool climate, it requires a fairly fertile soil, it thrives best on good garden loam with a tendency toward heaviness, and it requires a soil with a pH ranging between 6 and 7.5.

The term "annual" is applied to flowering or foilage plants that give good results in a single season from seeds, such as petunia, zinnia, sweet alyssum, or castor bean. Perennials have the added advantage of relative permanence. Once planted, most perennials do not require resetting for three years. Many of them produce springtime flowers, before the annuals appear above the ground, while most perennials produce plenty of bloom before late summer or fall.

A few well-planted beds of roses within a small enclosure can provide a great deal of pleasure throughout the season. Partly because of the special esteem in which the rose is held, partly because of the cultural requirements of the rose, and partly because the rose lacks the fullness of growth characteristic of some cultivated plants, it demands special compositional arrangement. In planning a rose garden, a few essential considerations should be kept in mind: an enclosure that does not lack air and that gives shelter from the wind; a background wall or hedge from which the blooms may be seen to the best advantage; and a geometric pattern to give the design definite form, so that the garden will have a beauty of its own. When roses are cut for decorative purposes, they should preferably be cut early in the morning, before they have been affected for hours by the sun.

Ever since the Alpine garden and the wild garden were introduced in England in the second half of the 19th century, the many possibilities of rock gardens have had a steadily increasing vogue. At its best, a rock garden consists of a collection of Alpine plants in an environment closely approximating the conditions of their native habitat. True Alpine plants grow in a stone soil that is moist but through which water passes readily. The regions of our country which favor the development of rock gardens are found near the Great Lakes, the mountains and hills of the Appalachian chain, the rugged landscapes of New England, the Rocky Mountain states, and the Pacific Coast. A site surrounded by an artificial atmosphere is inappropriate for a rock garden. A rock garden should harmonize with the informality and casual character of natural foliage. Honeysuckle, juniper, and Japanese yew are several of the shrubs suitable for a rock garden.

The herb garden was one of the earliest expressions of garden art during the Renaissance. Physic gardens at that time were planted within the cloistered walls of monasteries. From these gardens the Monks dispensed a variety of medicinal herbs in an effort to alleviate the physical suffering and distress of their people. This was a period when the enjoyment of plants for their beauty alone, while not entirely forgotten, was at least secondary in importance to their potential therapeutic uses. Plants were regarded as a source of medicine, as a flavoring in cooking, as a source of color in dyeing materials, and in some instances for their fragrance alone. Knowledge of these plants was general throughout the countryside, as is made evident by the wealth of plant names found in most European languages. The many superstitions and the folklore surrounding such plants were passed on from one generation to another.

Early colonial settlers in the United States brought with them a knowledge and understanding of the various uses of herbs, and before long many familiar Old World plants were flourishing in the villages and towns of New England. In the 19th century interest in herbs declined steadily, and the herb garden as such became an almost forgotten thing of the past. Within the past decade or so, there has been a reawakening of

interest in the culture and use of herbs, so that once again many persons have begun to appreciate the quaint beauty and charm of the herb garden.

Herbs are divided into several groups. Aromatic herbs are grown for fragrance, culinary herbs are used as flavoring ingredients in cooking, and medicinal herbs still play a limited role in modern medicine, while herbs grown for coloring are incorporated in various dyes.

Gardening is a delightful experience for many physicians. Those physician-gardeners who own a small greenhouse are fortunate indeed, as they are able to carry on their gardening activities throughout the year. New types of greenhouses have recently been designed along simple, efficient lines, greatly reducing construction costs. A small greenhouse is now well within the pocketbook range of many gardeners. Such an investment usually pays large dividends in both beauty and relaxed, joyful activity.

MEDICAL FILM REVIEWS

Safe and Effective Oxygen Therapy: 16 mm., color, sound, showing time 22 minutes. Produced in 1956 for and procurable on loan from Linde Air Products Company, 30 E. 42nd St., New York 17.

This film outlines the current procedures for administering oxygen by mask, catheter, tent, and hood. The mechanisms by which the control of oxygen is maintained are stressed. The use of oxygen in Isolettes and incubators is described, and the importance of observing the oxygen concentration in the incubator is brought out. Intermittent positive-pressure breathing valves, aerosol, and high-humidity devices are also demonstrated and discussed. The flow meter's response to various types of back-pressure created by resistant apparatus and the adjustment for this are also shown. Throughout the film, the necessary precautions against such things as excessive noise and combustion, as well as various possible sources for ignition, are stressed and discussed. The importance of maintaining certain concentrations as ordered is brought out. This film has been well prepared and is highly recommended for medical students, nurses, interns, and nurses aides.

Fractures of the Shaft of the Femur: 16 mm., color, sound, showing time 21 minutes. Produced in 1956 by Churchill Wexler Productions, Los Angeles, for the Veterans Administration. Procurable on loan from Central Office Film Library, Veterans Administration, Washington 25, D.C.

This film explains that, in treating fractures of the shaft of the femur, the surgeon is working against the pull of some of the strongest muscle groups in the body. The film discusses the various means of overcoming the displacements caused by these muscles. Treatment for fractures of the upper, middle, and lower portions of the shaft are demonstrated. The principles of suspension traction as well as open reduction are illustrated, and the problems of after-care are considered. Balanced traction is emphasized, which is proper for a film of this type. The most widely used methods of internal fixation are demonstrated by diagram and by actual surgical illustration. No attempt is made to present the more complicated surgical procedures. The photography is excellent, with superb diagrammatic illustrations, and the narration is excellent. This is a basic teaching film and should be of interest to all physicians who treat fractures. It should be of specific teaching value for those in training and for general practitioner groups.

Stapes Mobilization, Footplate Visualization Method: 16 mm., color, silent, showing time 11 minutes. Prepared by George E. Shambaugh Jr., M.D., Eugene L. Derlacki, M.D., and Wiley H. Harrison, M.D., Chicago. Produced in 1956 by Mervin W. LaRue, Inc., Chicago. Procurable on loan or purchase ($200) from George E. Shambaugh Jr., M.D., 55 E. Washington St., Chicago.

This film depicts the technique of stapes mobilization, as developed by the authors, with photography of a complete operation from the injection of local anesthesia to the final dressing. This technique emphasizes direct visualization of the footplate at 16 × magnification through the operating microscope. The steps in the operation are demonstrated by means of endoscopic photography, and the motions of the mobilization of the stapes are well shown. Of particular interest are the two sequences in the film which show clearly how the actual footplate of the stapes can be mobilized by this technique. The sequence is very good, and clinical data, indications for surgery, and results are demonstrated by means of charts and audiograms. This is an excellent film and should be of particular interest to otolaryngologists and otologists. However, there may be interested practitioners, medical students, and audiologists who would like to view this for a better understanding of the physiology of hearing.

NEW FILM ADDED TO A. M. A. MOTION PICTURE LIBRARY

Principles of Respiratory Mechanics, Part II: 16 mm., color, sound, showing time 21 minutes. Prepared by Jere Mead, M.D., Edward P. Radford, M.D., Benjamin G. Ferris Jr., M.D., James L. Whittenberger, M.D., Harvard School of Public Health, and Matilda C. Smith, National Foundation for Infantile Paralysis. Produced in 1956 by Science Pictures, Inc., under a grant from the National Foundation for Infantile Paralysis. Procurable on loan (service charge $1.00) from Motion Picture Library, American Medical Association, 535 N. Dearborn St., Chicago 10.

This film uses both normal subjects and patients with asthma, pulmonary fibrosis, emphysema, and respiratory muscle paralysis to illustrate alterations in the mechanics of breathing produced by disease. Models and animated drawings are used to illustrate pulmonary subdivision and such concepts as work of breathing and the value of mechanical measurements. The pictures of normal and abnormal human subjects are supplemented with diagrams which show instructive laboratory experiments. The two mechanical models are outstanding. The organization of the picture is good, and the content is well summarized. The photography is excellent. It is a basic teaching film and should be most useful in courses on the physiology of respiration for medical students during the first or second year. It should also interest physicians.

MEDICAL LITERATURE ABSTRACTS

INTERNAL MEDICINE

Lesions of Lung in Geriatric Patients: Incidence and Surgical Mortality. E. J. Beattie Jr. J. Am. Geriatrics Soc. 5:54-58 (Jan.) 1957 [Baltimore].

Of 190 patients with pulmonary lesions that either required operation or could not be diagnosed, 79 were 60 years of age or older. Of the 111 patients who were less than 60 years old, 33 had malignant tumors, 56 had pulmonary infections, and 22 had miscellaneous lesions. Of 46 patients who were less than 60 years of age and who underwent thoracic operations, 22 had exploratory thoracotomy and lung biopsy, 17 lobectomy, and 7 pneumonectomy. One of the 46 patients had ventricular fibrillation during the induction of anesthesia and died 36 hours after the operation. Operative death rate was of 2.2%. Of the 79 patients who were 60 years of age or older, 49 had malignant tumors, 17 had infections, and 13 had miscellaneous lesions, the commonest being pulmonary infarction. The incidence of pulmonary cancers thus was 62% in the older patients as compared to 30% in the younger patients. Of the 79, 47 underwent thoracic operations; 20 had exploratory thoracotomy, 13 lobectomy, and 14 pneumonectomy. There were 4 operative deaths from pulmonary embolism, pulmonary edema, uremia, and pulmonary insufficiency respectively. The operative death rate was 8.5%, as compared to 2.2% among the patients aged less than 60 years.

Incidence of Complications Among Elderly Hospital Patients. M. Rang. Lancet 1:401-402 (Feb. 23) 1957 [London].

How do older patients fare in hospital? Are older patients less able to bear hospital discipline and procedures than young and middle-aged patients? Are they more likely to develop complications than younger patients? What complications occur in the hospital, and what proportion of patients are affected? In an attempt to answer these questions a survey was made of the complications arising during the 12 weeks from July to October in 2 geriatric wards, 1 for men and 1 for women, each with 30 beds. All conditions arising during the survey that had been absent on admission and that were not clearly related to the patients' original disease were classed as complications. During the period of the survey there were 86 admissions and 82 discharges. Complications developed in 45 patients 12 of whom had more than 1 complication (60 complications in all). Four of the men and 2 of the women had been admitted to give their relatives a rest from home nursing. In all 6 of these patients complications developed. Patients in a general medical ward with 30 beds and 26 residents of a half-way house (a residence attached to the hospital for elderly persons) served as controls.

Complications developed in 2 of every 3 patients admitted to a geriatric unit, whereas in a general medical ward complications developed in only 1 patient in 10. The complication interval (the time between complications for any geriatric bed) was roughly 11 weeks—four times shorter than that of either the general medical ward or half-way house. Complications developed in 26 (39%) of the 67 women in the geriatric ward and in 19 (26%) of the 74 men, but the proportion of men in whom further complications developed was about twice as great as that for women. Nearly half of the complications (26 of 60) were due to infection. Four of 5 urinary infections such as "catheter fever" and pyuria developed after urine (sterile on culture) had been withdrawn by catheterization. This cannot be blamed entirely on the nurse's technique, for the same nurses working in other hospital departments do not introduce infection. Twelve complications were due to falls or to confusion. Taking a slightly demented older person out of his home and putting him in a large ward, expecting him to climb in and out of a hospital bed, subjecting him to a routine that is strange and at times alarming, and asking him to try to walk with few and unfamiliar handholds puts a big strain on him. A 4th of all deaths in the 2 geriatric wards were due to complications. It is estimated that in a geriatric unit of 80 beds 1 complication may be expected every day and 3 deaths from complications each month.

Pulmonary Tuberculosis and Diabetes Mellitus. M. T. Warwick. Quart. J. Med. 26:31-42 (Jan.) 1957 [Oxford, England].

The prevalence of pulmonary tuberculosis among patients attending the diabetic clinic at University College Hospital between 1940 and 1954 was 18.2 per 1,000 diabetic patients examined. The prevalence among a sample of the general population was 4.9 per 1,000. The author reports observations on 104 patients with diabetes and active tuberculosis, about half of whom came under the care of a hospital for chest diseases and the rest of whom attended a diabetic clinic where tuberculosis was diagnosed during the course of their supervision. There was a greater prevalence of tuberculosis among diabetic women than among diabetic men in practically all age groups up to the age of 65. In the group of diabetic patients

---

The place of publication of the periodicals appears in brackets preceding each abstract.

Periodicals on file in the Library of the American Medical Association may be borrowed by members of the Association or its student organization and by individuals in continental United States or Canada who subscribe to its scientific periodicals. Requests for periodicals should be addressed "Library, American Medical Association." Periodical files cover 1948 to date only, and no photoduplication services are available. No charge is made to members, but the fee for others is 15 cents in stamps for each item. Only three periodicals may be borrowed at one time, and they must not be kept longer than five days. Periodicals published by the American Medical Association are not available for lending but can be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

over 65 years of age, diabetic men appeared to show an increased prevalence of tuberculosis compared with the control group, but no appreciable difference was demonstrated among the women. Diabetes mellitus was the initial disease in 77 in this series of 104 patients; in 19 tuberculosis and diabetes were diagnosed simultaneously, and in 8 tuberculosis was diagnosed first. No significant difference in the severity of diabetes was demonstrated between patients with and those without tuberculosis. This finding differs from those of some other investigators. Poor control of diabetes was more common in patients in whom tuberculosis developed. This was particularly noticeable in the younger age groups. A significantly higher proportion of diabetic patients in whom tuberculosis developed had had episodes of ketosis than that in other diabetic patients.

Thus age, sex, control of diabetes, and ketosis influenced the prevalence of tuberculosis. No evidence was found to support the specific radiologic appearances described as "diabetic tuberculosis." Twenty-five per cent of diabetic patients treated for tuberculosis before 1950 died from tuberculosis between 3 and 7 years from its onset, but no patient in this study treated with antituberculous drugs has yet died from tuberculosis. Factors influencing prognosis were control of diabetes, the initial extent of tuberculosis, and the method of treatment of tuberculosis.

Portal Circulation in Portal Hypertension. I. Bergstrand and C. A. Ekman. Acta radiol. **47**:1-22 (Jan.) 1957 (In English) [Stockholm].

One hundred fifteen lienoportal venograms were made with an automatic film changer and by standardized technique in 88 patients, 70 of whom were studied in detail. The 70 patients were subdivided in 2 groups, i. e., group A comprising 16 patients with normal circulation in the portal system and group B comprising 54 patients with portal hypertension. Of the 16 patients in group A who served as controls, 15 showed no evidence of liver disease or any disease involving the portal system and 1 man had a long history of heart disease, without signs of cardiac decompensation. The spleen was not enlarged in most of the patients. Of the 54 patients in group B, 6 had an expansive growth either involving the splenic vein or the portal trunk, with consequent extrahepatic portal obstruction, or the expansive process was intrahepatic, 36 had cirrhosis of the liver, 9 had extrahepatic thrombosis, and 3 had miscellaneous diseases. Changes in the collateral circulation, the velocity of flow, and the width of the portal and splenic veins as observed in the lienoportal venograms of the 54 patients with confirmed portal hypertension were compared with those of group A.

A filling of the collateral vessels, such as the short gastric veins, intercostal veins, coronary vein, inferior mesenteric vein, and the veins in the hepatoduodenal ligament, was regularly obtained in the patients with portal hypertension but never in the controls. Filling of the collateral vessels was a sign of the circulatory change due to the increased pressure gradient between the portal and caval systems in all the patients. Atkinson and co-workers found a collateral circulation to be a definite, though not regular, sign of increased portal pressure. They claimed that the size of the collateral circulation in patients with portal hypertension is roughly proportional to the increase in portal pressure; such correlation was not found by the authors. The velocity of flow in the portal circulation was practically always lower in the patients with portal hypertension than in the controls. This finding was based on determinations made by measuring the spleen-hilum time, the spleen-liver time, and the emptying time of portal branches in seconds. The widths of the splenic and portal veins were often increased in the patients with portal hypertension. In patients with hepatic cirrhosis the accumulation of the contrast medium in the liver parenchyma was less dense and the hepatic veins were less frequently demonstrable than in the controls. The method used in this study is accurate enough for the clinical diagnosis of portal hypertension.

The Liver, Biliary Tract and Pancreas in the Aged: An Anatomic and Laboratory Evaluation. Z. R. Morgan and M. Feldman. J. Am. Geriatrics Soc. **5**:59-65 (Jan.) 1957 [Baltimore].

The liver, biliary tract, and pancreas were studied on autopsy in 74 patients between the ages of 75 and 95 years in whom the clinical evaluation had not revealed any pathological conditions in the hepatobiliary-pancreatic system. Lesions of the liver were found in 12 of the 74 patients; of these 3 had Laennec's cirrhosis, 1 primary carcinoma, 5 pronounced fatty degeneration, 2 congenital cysts, and 1 necrosis. Thus the incidence of hepatic lesions was low. The weight of the liver was determined in 72 of the 74 patients and was normal in 50. Most of the patients were not alcoholics, and that may account for the fact that only 3 had Laennec's cirrhosis. The liver in older persons functions with a large margin of safety, and liver diseases are not a major cause of death. Biliary stones were found in 27 of the 74 patients. Pancreatic disease was not a major cause of death in this group of older patients. Diabetes mellitus was present in 3 patients. The spleen showed few, if any, pathological changes. Splenomegaly was observed in 13 of the 74 patients and was associated with an enlarged liver in 4. Biochemical studies of the blood had been carried out in 19 patients during life; they yielded little information regarding the condition of the liver, gallbladder, and pancreas. In older patients, functional changes in these organs are not measurable by ordinary methods of examination.

Spectacular Effect of Deltacortisone on Postgastrectomy Deficiency Edemas. P. Vesin, P. Frumusan and R. Cattan. Semaine hôp. Paris **33**:72-75 (Jan. 10) 1957 (In French) [Paris].

The postgastrectomy deficiency syndrome is characterized by profound impairment of the general condition, with asthenia, loss of weight, and severe edema of the lower limbs and lumbar region, sometimes even anasarca, often accompanied by diarrhea. The basic biological disturbance, in addition to hypochromic anemia, hypolipemia with hypocholesterolemia, and

hypocalcemia, is the existence of pronounced hypoproteinemia and the decided reduction in blood albumin. The administration of deltacortisone to 3 patients presenting this syndrome was followed by water and sodium diuresis resulting in the complete disappearance of edema and a definite improvement in the general condition, with restoration of appetite. The rapidity with which these effects were secured contrasted strongly with the prolonged period needed when the customary methods of treatment (plasma therapy and milk given in divided doses) are used.

The capital part played by aldosterone in sodium retention, as shown by the high level of urinary aldosterone found in all patients with chronic progressive edema, whether the underlying condition is nephrotic, cardiac, cirrhotic, or hypoproteinemic, formed the basis for the authors' original suggestion that cortisone might inhibit the aldosterone hypersecretion and so lead to the disappearance of sodium retention and to sodium diuresis. Various observations have since confirmed the importance of aldosterone in sodium retention and the value of deltacortisone in the treatment of edema. Other studies, however, seem to show that the action of deltacortisone is indirect and that the reduction in aldosterone secretion is brought about by a hydroelectrolytic change, the nature of which is unknown. The similarity between the various forms of edema—cardiac, cirrhotic, nephrotic, and hypoproteinemic—suggests that chronic edema should be regarded as a "disease of homeostasis." The remarkable antiedemic action of deltacortisone and its beneficial effect on the appetite and the general condition make it exceptionally valuable in the treatment of deficiency edemas. It should be supplemented, however, by standard measures, such as realimentation, milk therapy, plasma therapy, transfusions, and intravenously administered albumin, which are still indispensable to the restoration of the body's protein reserves.

Relations between Arteriosclerosis and the Serum Cholesterol Level. P. David and E. Eddie. Union méd. Canada **86**:155-159 (Feb.) 1957 (In French) [Montreal].

Serums of 720 patients were analyzed for cholesterol in order to establish the relationship between atherosclerosis and hypercholesterolemia. The patients were divided into 2 groups: (1) 392 with arteriosclerosis who suffered from angina pectoris, myocardial infarction, hypertension, and uncomplicated arteriosclerosis and (2) 328 with rheumatic or congenital heart disease or with diseases other than cardiac diseases. Of the 1st group 146 (37.2%) and of the 2nd group 44 (13.4%) had a marked increase of their serum cholesterol levels. The normal level in man varies from 132 to 300 mg. per 100 cc., but the level in the individual remains nearly constant. An increase of the total cholesterol in the blood may signify a passing of cholesterol from the tissue into the blood, whereas a higher serum cholesterol level may signify a migration of the cholesterol of the erythrocytes into the serum. These modifications are due to the influence of the hypophysis, the gonads, and the thyroid.

Hypercholesterolemia appears not to be indispensable for the formation or development of atherosclerosis, since many patients with this disease have normal serum cholesterol levels. Disorders of the total lipid metabolism in patients with atherosclerosis might be reflected in the cholesterol metabolism. Hypercholesterolemia, therefore, may indicate atherosclerosis, but this is far from being the rule, because many factors affect the cholesterol metabolism.

Present Status of the Treatment of Ascitic Cirrhoses with Deltacortisone. R. Cattan and P. Vesin. Semaine hôp. Paris **33**:76-79 (Jan. 10) 1957 (In French) [Paris].

Deltacortisone, which has an intense diuretic action and causes only slight sodium retention when given in standard doses, has been found to be useful in the treatment of patients with ascitic cirrhoses (excluding those in coma). In a series of 32 patients the drug gave complete relief of edema persisting after the withdrawal of deltacortisone in 14 and temporary relief of edema during therapy in 4 and failed in 14. These figures and those of others seem to show that 3 or 4 patients in 10 respond favorably to deltacortisone. The effect of the drug, however, is unpredictable, and unexplained failures are frequent. Two factors that may be significant in this connection are the presence of renal lesions and the existence of severe progressive hepatic insufficiency. The best results are apparently obtained when the general condition is fairly good, although many patients in poor condition as a result of denutrition and anorexia have also been successfully treated.

The effect of deltacortisone in edema is due primarily to its action on salt and water metabolism. Diuresis usually begins during the first 3 or 4 days but may be late, appearing about the 8th day. Consequently, treatment with deltacortisone should not be given up before 10 days have elapsed. The quantity of urine excreted may rise from 500 or 1,000 cc. a day before treatment to 2,000 or 3,000 cc. or even more when diuresis sets in. Interesting features of the diuresis are that it often occurs chiefly at night, that it leads to a rapid loss of weight, sometimes amounting to several hundred grams a day, and that, in spite of its intensity, it is not accompanied by thirst. A factor of major importance in every patient in whom dehydration was secured and maintained after the withdrawal of deltacortisone was the urinary excretion of enormous amounts of sodium, leading to a negative sodium balance. Hyponatremia, however, was never observed; on the contrary, the blood sodium level often increased as the edema regressed. This sodium diuresis, without which dehydration is impossible, marked the end of the intense sodium retention found in these patients. The mechanism by which the change was produced seemed to be the disappearance of adrenocortical hypersecretion of aldosterone with its powerful sodium-retaining properties.

Contraindications to the use of deltacortisone are found chiefly in patients with a history of gastroduodenal ulcer, diabetes, or renal lesions (hematuria and azotemia). The presence of ordinary pyogenic or tuberculous infections is not a contraindication if the

appropriate antibacterial therapy is given at the same time. Corticotherapy, when combined with antibiotics, can often be used to advantage in the treatment of infections, especially tuberculosis. Deltacortisone is an ideal treatment for patients with edema and should be tried first unless contraindicated. A suitable scheme of treatment would consist of an observation period of 8 or 10 days, with bed rest and partial suppression of salt in the diet, followed by the administration of deltacortisone in doses of 40 mg. the 1st day, 30 mg. the 2nd day, and 20 mg. the 3rd day and daily thereafter until dehydration has been secured. The deltacortisone may then be withdrawn, but the patient should be kept under observation. The weight in particular should be closely watched, and an easy-to-follow salt-poor diet should be continued for some time. Other methods, such as a rigidly salt-poor diet, the use of mercurial diuretics, ion-exchange resins, and acetazolamide (Diamox), must be used if deltacortisone fails to relieve the edema, but, even when these methods are needed, deltacortisone may be continued in doses of from 10 to 20 mg. a day because of its anorexic and euphoriant effect.

Self-Healing, or Abortive, and Residual Forms of Childhood Leprosy and Their Probable Significance. C. B. Lara and J. O. Nolasco. Internat. J. Leprosy 24:245-263 (July-Sept.) 1956 [New Orleans].

Of 347 children with leprosy observed at the Culion Sanitarium in the Philippines in the course of 24 years, 287 were studied for 2 years or longer after the onset of the disease. Some of the children were born at the sanitarium and others were still nonleprous when admitted with their leprous mothers. Spontaneous, apparently complete healing occurred in 223 patients (77.7%) despite continued residence in the infected environment. Incomplete healing—recurring exacerbations alternating with periods of incomplete subsidence of lesions—was observed in 36 (12.5%). The disease tended to progress in the remaining 28 (9.7%).

There was correlation between the process of healing and the clinical morphology of the initial or earliest recognizable lesions, as well as with the bacteriological, histological, and immunological features. The incidence of complete healing of the lesions was highest among the patients with papulonodules and other definitely circumscribed, thickened initial lesions and lowest among the patients with the infiltration-like, more or less diffusely thickened initial lesions. In patients with the wheal-like and the raised and flat macular lesions the incidence occupied an intermediate position. There a fairly good correlation was found between low bacterial content of the lesions, strong reaction to repeated intracutaneous injections of lepromin (Mitsuda test), and a high proportion of healed lesions. The correlation between clinical morphology and healing seemed to be even more consistent. Concerning histological correlation, healing of lesions with undifferentiated, round-cell, or monocytic infiltrates occurred earlier than that of lesions with a tuberculoid structure, except for papulonodules.

Relapses, when they occurred, were chiefly noted within less than 3 years of apparent healing, gradually becoming more rare after longer periods, and relapses were practically not seen at all after 10 years. Relapses occurred more frequently in children whose early lesions showed a tuberculoid appearance on microscopic examination than in those with undifferentiated lesions. They were also more frequently observed among the patients with wheal-like and macular early lesions than among those with papulonodules, lichenoid, or scar-like indurated lesions. Eight patients showed inconspicuous, minimal, definite or suspicious signs of active disease, such as enlarged or tender nerve trunks, with or without anesthesia, and micropapulate or follicular residual lesions at or near anesthetic atrophic scars. These residual lesions are likely to be overlooked in ordinary surveys, especially without the aid of previous records or history. It is probable that most of them are benign but there is always the possibility that they and other undetected forms of apparently healed, or latent, primary infections may serve as sources for further dissemination. Continued observations on the development of lesions in a group of children who while very young had been given repeated intracutaneous injections of lepromin were compared with those in a group similar in age and sex who did not receive lepromin injections. Findings supported the earlier suggestion that lepromin injections in the form of the Mitsuda test may have protective value, especially when given to very young children.

Infections in Leprosy Institutions. A. R. Davison. Internat. J. Leprosy 24:275-279 (July-Sept.) 1956 [New Orleans].

The concepts of some leprologists that leprosy is only, or mostly, acquired in infancy and that it is unnecessary for adults to take even rudimentary precautions against infection are considered dangerous by Davison. He describes the cases of 2 physicians, born in England, who acquired leprosy at the ages of 53 and 60 years while working as medical officers at a leprosy institution in Pretoria, South Africa, 3 Europeans who contracted leprosy as adults when working as overseers in leprosy institutions in South Africa, and 10 cases among adult Bantus who worked in leprosy institutions and contracted the disease at the average age of 46 years, although the onset of leprosy among Bantu males occurs generally at the age of 19. A plea is made for elementary hygienic practices by the staff in leprosy institutions.

Another concept that is attacked by the author as dangerous is that leprosy can be contracted only after long-continued close contact. He describes a case of leprosy in a male native child who was born of a leprous woman in an African leprosy institution. The infant was removed from his mother 6 weeks after birth and had not been exposed to infection after that. The first symptoms of leprosy occurred in the child 13 months later. The author believes that infected persons should not come in contact with children and that breast feeding of children born in leprosy institutions is to be condemned.

SURGERY

Mucosal Carcinomas as a Result of Irradiation. D. P. Slaughter and H. W. Southwick. A. M. A. Arch. Surg. 74:420-429 (March) 1957 [Chicago].

The authors present 9 patients in whom carcinoma arose in mucous membranes included in a field of radiation therapy. In 6 of these patients squamous cell carcinomas of mucous membranes developed in areas treated by external roentgen irradiation from 9 to 25 years before appearance of the tumors. Each patient experienced late radiodermatitis in the skin utilized for the external port. There was also fibrosis of the tissues between the skin and the affected mucosa. There was microscopic evidence of radiation change in the mucosa and submucosa of all the cancer-bearing areas. Treatment was unsuccessful, and the authors believe that this failure was due to the multicentric origin of the tumors, with new foci developing in the irradiated mucosa at a rate impossible to control. Three of these tumors, the 2 of the tongue and the 1 of the anus, developed in patients treated for cancer of adjacent organs or tissues. The anal lesion could hardly be a late localized recurrence of the cancer of the cervix treated 11 years before; the one epidermoid carcinoma of the tongue could not be a recurrence of malignant mixed tumor of the parotid, which showed no local persistence after 9 years. The other tongue lesion occurred in an irradiated area 13 years after successful radiotherapy for a presumed cancer of the nasopharynx. The 2 hypopharyngeal cancers occurred in patients treated for inflammatory cervical lesions, one of them tuberculous adenitis. The squamous cell cancer of the buccal mucosa represents the culmination of a compound tragedy of errors in a patient whose ossifying fibroma of the upper maxilla was erroneously diagnosed as adamantinoma and treated with irradiation over a period of years. Even if the tumor had been an adamantinoma the irradiation was incorrect treatment.

In 3 patients adenocarcinoma developed. An adenocarcinoma of the transverse colon developed directly beneath an obvious area of skin change on the anterior abdominal wall where irradiation had been used as treatment for a duodenal ulcer four years before. The time interval is short as compared with the intervals in reports of other irradiation-induced cancers, but the previous treatment and residual objective findings at least suggest a causal connection. The carcinoma of the rectosigmoid occurred in the field of irradiation in a woman treated for cancer of the uterine cervix. Again the time interval is only three years, but there is demonstrable irradiation change in the intestinal wall about the tumor. In the patient with the adenocarcinoma of the cervical esophagus the long interval between irradiation and tumor formation (25 years) and the obvious irradiation changes in the tissues of the neck indicate that this is almost certainly an irradiation-induced cancer. The epithelium of mucous membranes, like that of the skin, is capable of malignant tumor formation as a late effect of irradiation.

NEUROLOGY & PSYCHIATRY

Virologic Investigations on the Etiology of Two Institutional Epidemics of Poliomyelitis. P. Kraus. Monatsschr. Kinderh. 105:17-19 (Jan.) 1957 (In German) [Berlin].

One of the 2 poliomyelitis epidemics discussed in this paper occurred in an infant nursery, the other in a whooping cough pavilion in another children's hospital. In the infants' nursery 10 strains of poliomyelitis virus, all of which belonged to the Brunhilde or type 1 virus, were cultured from 23 specimens of feces. This type of virus was isolated not only in the nursling who seemed to be the carrier responsible for the epidemic outbreak, but also in 5 of the 8 infants in whom symptoms of poliomyelitis developed and in 1 of 5 who remained free from symptoms. The epidemic character of this outbreak, which occurred in July and August, was proved not only by the presence of type 1 virus but also by the demonstration of neutralizing antibodies in nearly all the infants. This, moreover, proved that the capacity of infants to form antibodies is not significantly less than that of adults. Two of the 9 infants who had symptoms had the meningitic form of poliomyelitis, and all the others had paralytic signs.

The epidemic in the whooping cough pavilion occurred in December, 1955. The paralytic form of poliomyelitis occurred in only 1 of 22 young children. Spinal punctures were performed in all of these children and an increase in the cell count was observed in 10 of the remaining 21. Examination of the feces disclosed poliomyelitis strains of type 1 in 4 of these 10 children. The same type of virus was found also in the feces of the child with paralytic poliomyelitis and in the feces of 1 of the 4 nurses. Serologic tests were carried out in all of the children twice. The comparison of spinal cell counts with the serologic tests indicated an increase in the titer, showing that infection had taken place in all but 3 of the children. The fact that no serologic changes were detected in 5 despite an increase in the cerebrospinal fluid cell count is explained by technical inadequacies. The contrary occurrence, that is, a serologic reaction without a spinal fluid reaction, which was observed in 3 patients, proves that a poliomyelitis viremia (the prerequisite of antibody formation) can occur without a pathological reaction in the central nervous system. Despite the differences in the clinical manifestations of these 2 epidemics, they showed the characteristics that the authors had previously observed in infections with type 1 virus, namely, a tendency to cause epidemics in groups not immunized against poliomyelitis.

Value of Pneumoencephalography and Other Methods of Examination in Diagnosis of Organic Brain Diseases: Study of Clinical Material. C. L. Laane, T. Solheim and A. Straand. Tidsskr. norsske lægefor. 77:107-112 (Feb. 1) 1957 (In Norwegian) [Oslo].

Pneumoencephalography is helpful in evaluating the possible presence of organic brain changes. Because of suspected brain disease suggested by clinical, electroencephalographic, and/or neurological findings, it was carried out in a series of 100 psychiatric patients and

gave positive evidence of organic brain disease in 70. Most of the positive penumoencephalographic results were in patients aged 31 to 60 years with duration of illness of 1 to 10 years. In 44 of 49 patients with clinical signs of organic brain disease the pneumoencephalographic examination gave positive results. The results were positive in 25 of 28 patients with positive electroencephalographic findings and in 20 of 22 with positive neurological findings. Roentgenographic examination of the head was of little value. Besides pneumoencephalography, careful clinical examination is the most valuable method for detecting organic disease of the brain.

Abnormal Immunological Reactions in Disseminated Sclerosis: A Preliminary Report. H. V. Smith, M. L. E. Espir, C. W. M. Whitty and W. R. Russell. J. Neurol. Neurosurg. & Psychiat. **20**:1-10 (Feb.) 1957 [London].

It has been established that the injection of tuberculin into the spinal fluid of a sensitized subject evokes a wave of inflammation involving the meninges and to some extent the vessels of the brain and spinal cord. This is a true antibody-antigen response. It exerts a profound effect on the permeability of the blood-brain barrier, and it has proved a useful adjuvant in the treatment of tuberculous meningitis. Because it was suggested to the authors that these reactions might be beneficial in multiple sclerosis, they studied the effects of the intrathecal injection of tuberculin in this disease and compared them with the effects in psychosis of mixed etiology. The different factors involved were explained to the patients with multiple sclerosis, and volunteers were obtained. Most of the patients had been under observation for months or years. Serial Mantoux tests were done in the usual way with old tuberculin, diluted to 1 in 10,000, 1 in 1,000, and 1 in 100. The purified protein derivative of tuberculin was used for the intrathecal injections. The mental disorders in the controls ranged from mental deficiency to advanced schizophrenia, and some had been subjected to cingulectomy and leukotomy. In all of them the spinal fluid was normal at the first examination.

Striking and consistent differences were observed between the intrathecal tuberculin reaction in the patients with multiple sclerosis and the controls. In particular, the correlation seen in the controls between the intensity of the intrathecal reaction and the result of both the Mantoux test and the dose of tuberculin was not apparent in multiple sclerosis. The pattern of the reaction also was distorted, in that the characteristic polymorphonuclear leukocyte component was suppressed, while the increase in protein was exaggerated. A similar suppression of the polymorphonuclear component could be artificially produced in controls by giving cortisone. The response in tuberculin-negative patients with multiple sclerosis to vaccination with Wells' vole vaccine or BCG was anomalous, in that, contrary to experience with the controls, sensitization of the skin and of the meninges was markedly dissociated. The immediate clinical effects of the intrathecal injection of tuberculin were alarming in 2 patients with brain-stem lesions but otherwise were associated with little immediate change in the clinical findings. Follow-up studies suggested, however, that the course of the illness may have been modified for good.

Electroencephalogram in Narcolepsy. D. D. Daly and R. E. Yoss. Electroencephalog. & Clin. Neurophysiol. **9**:109-120 (Feb.) 1957 [Montreal, Canada].

Narcolepsy is characterized by episodes of sleep usually of brief duration but recurring many times daily. In many instances there are associated cataplectic attacks characterized by loss of muscle tone without change in consciousness. These attacks are commonly induced by laughter, anger, fright, or startling stimuli. Episodes of so-called sleep paralysis may occur while falling asleep or awakening. During these the patient is conscious but unable to move. Many patients with narcolepsy are also subject to hypnagogic hallucinations and nightmares. The 100 patients reviewed in this article belong to a series of 241, in all of whom the diagnosis of narcolepsy had been established clinically. This group of 100 patients in whom electroencephalographic studies were made did not differ in any essentials from the entire group of 241 patients. The series was compiled by selecting consecutively the records of 100 patients from the files of the electroencephalographic laboratory during the years of 1950 to 1954. Sixty-four of the patients were men and 36 women. Seventy-one were between 21 and 50 years of age. The decade of age in which there was the largest number of patients was 31 to 40 years. In 85 of the patients the narcolepsy was associated with other symptoms of cataplexy, sleep paralysis, or nightmares in varying combinations. The most frequent combination, occurring in 37, was narcoleptic and cataplectic attacks.

Recordings were made on 8-channel model IV Grass electroencephalographs. A total of 14 electrodes was used. No attempt was made to permit the patients to go to sleep during the routine recording. The basal or alert electroencephalograms were found to be within normal limits. Drowsiness began within the first 4 minutes of the recording in most patients. Almost all patients manifested drowsiness at some time during the recording. Sustained drowsiness lasting for periods up to 30 minutes was characteristic of these patients. Opening and closing the eyes, counting, hyperventilation, and photic stimulation, measures which alert the normal patient, were commonly ineffective in narcoleptics. In spite of persistent drowsiness, actual sleep was uncommon under the circumstances in which the recordings were made. Electroencephalograms made during cataplectic attacks and an attack of sleep paralysis were normal.

Medical Aspects of Boxing, Particularly from a Neurological Standpoint. M. Critchley. Brit. M. J. **1**:357-362 (Feb. 16) 1957 [London].

The author has observed 69 patients with chronic neurological disease due to boxing. Many of these showed evidences of punch-drunkenness, either early or well established. Chronic progressive traumatic en-

cephalopathy of boxers is suggested by the author as an alternative name for the popular term "punch-drunkenness." Punch-drunkenness is more frequent among professionals than among amateurs and among second-rate or third-rate performers than in the intelligent scientific exponent with a championship title. It is rare in Negroes. Punch-drunk states have been found in fighters of all weights, but most characteristically in small men who had not been particular about the size of their opponents, having often taken on contestants heavier than themselves. There is a correlation between the degree of craniofacial marking and the intensity of the punch-drunk syndrome. The total number of bouts is important, as well as the number of occasions on which the boxers have been rendered unconscious. As a rule, gradual evolution of mental and physical anomalies marks the insidious onset of the encephalopathy. Among mental symptoms there is the slow appearance of a fatuous or euphoric dementia with emotional lability. The victim shows little insight into his condition. Speech and thought become progressively slower; memory, efficiency, and conduct deteriorate; and there may be mood-swings, intense irritability, and sometimes truculence leading to uninhibited violent behavior. Simple fatuous cheerfulness is, however, the most prevailing mood, although sometimes there is depression with a paranoid coloring. The patient may complain of persistent dull headache, postural dizziness, deafness, poor vision, intolerance toward alcohol, unsteady gait, and shakiness. Occasionally periodic convulsions bring the victim to the doctor.

The condition popularly referred to as a "groggy state" is the result of severe battering sustained during a particular contest. The victim develops a mental confusion with subsequent amnesia, and an impairment in the speed and accuracy of his motor skill. In this state he makes feeble and poorly coordinated movements; his limbs are ataxic; and he is inefficient and vulnerable. An accumulation of groggy states probably leads to a permanent punch-drunk syndrome. Remitting cerebral concussion is suggested as an alternative term for groggy state. Minor nonspecific anomalies are common in the encephalogram of experienced boxers. Such findings are more frequent and more intense in those with punch-drunkenness. The electroencephalogram is a less sensitive index of punch-drunkenness than is the clinical evidence, for symptoms and signs may be present at a time when the electroencephalogram appears to be normal. A return to a normal state in a series of electroencephalograms taken in a particular patient cannot be regarded as a physiological, anatomic, or clinical recovery.

Brain Abscess and Cerebral Venous Thrombosis Associated with Congenital Cardiac Defects. G. Weber. Schweiz. med. Wchnschr. **87**:159-163 (Feb. 16) 1957 (In German) [Basel, Switzerland].

Of 79 consecutive patients with brain abscess, 4 had congenital cardiac defects. Of the 4 patients, the 1st, a 13-year-old boy, with pulmonary stenosis and transposition of the aorta, had a chronic sterile abscess in the lateral posterior segment of the right frontal lobe. The encapsulated abscess was extirpated from the subcortical medullary layer of the frontal lobe, and complete recovery resulted. The 2nd patient, a 24-year-old man with transposition of the aorta and with atrioventricular septal defect, had an acute nonencapsulated abscess in the lateral posterior segment of the right frontal lobe which was punctured and drained through a trephine opening in the right lateral portion of the frontal lobe. Antibiotic treatment was practiced with large doses of penicillin, streptomycin, and sulfonamides, and complete recovery resulted. The 3rd patient, a 25-year-old woman whose heart had 1 atrium and 2 ventricles, also had hypoplasia of the right ventricle, high ventricular septal defect, subtotal auricular septal defect, atresia of the tricuspid valve, transposition of the aorta, and pulmonary stenosis; an abscess located in the left temporal lobe was found to be associated with a large internal pyocephalus, which caused central respiratory paralysis and death. The 4th patient, an 8½-year-old boy whose heart had 1 atrium and 2 ventricles and atresia of the tricuspid valve, had an acute frontoparietal brain abscess associated with a craniopharyngioma; death resulted from respiratory paralysis. A 5th patient, an 11-month-old girl with Fallot's tetralogy, had thrombosis of the superior sagittal sinus and the cerebropontine veins. Death resulted from hemorrhagic infarction of both cerebral hemispheres.

Brain abscess and thrombosis of cerebral vessels may occur as complications in patients predominantly aged less than 30 years with congenital cardiac defects. A brain abscess may be associated with a congenital heart defect with intracardiac admixture of venous with arterial blood, and, therefore, most frequently with tetralogy of Fallot. The occurrence of a brain abscess is favored by a compensatory polyglobulism, which causes increased viscosity of the blood, slows the peripheral blood flow and so probably favors thrombosis. The source of infection frequently remains unknown in patients with such a brain abscess. It may be located in the area of either the greater or the lesser circulation. Brain abscesses associated with congenital cardiac defects are, as a rule, amenable to treatment.

GYNECOLOGY & OBSTETRICS

The Effect of Hysterectomy on Young Women. W. M. Jacobs, H. I. Daily and S. H. Wills. Surg. Gynec. & Obstet. **104**:307-309 (March) 1957 [Chicago].

Of a series of 568 hysterectomies, 68 (12.1%) were performed on women under 30. Forty-six of the 68 could be interviewed from 1 to 2½ years after the hysterectomy, and the following questions were asked: 1. Do you feel that your operation was worth while, and are your symptoms relieved? 2. Has the operation affected your sexual life? 3. Are you concerned about having no future menstrual periods? 4. Are you concerned that you will not be able to become pregnant? 5. Do you have any hot flushes or extreme nervousness, and, if so, do you take any treatment for these symptoms? All but 4 of the 46 patients were completely relieved of their symptoms, 3 were partially relieved,

and 1 patient stated that she had not been helped by the operation. Regarding the effect on sexual relations 28 said that there was no change; 13 who had had dyspareunia before operation were relieved of this and now had greater sexual satisfaction; and 5 reported that sexual relations were slightly less satisfactory, but they were not unduly concerned. None expressed concern over the loss of menstrual function. Only 2 of the 46 patients worried about the loss of fertility. Twenty-seven patients reported no vasomotor symptoms and 19 reported mild to moderate symptoms, quickly relieved by mild sedation.

The authors conclude that the more complete type of hysterectomy provides much better results than does partial resection, leaving behind a nonfunctioning uterus simply because a patient happens to be relatively young. If the pelvic disease has made future pregnancies impossible, a total hysterectomy should be performed, provided the patient is in good physical condition and has been made aware of the procedure and agrees to it beforehand.

A Study of Bladder Function Following Vaginal Hysterectomy. J. W. Bowers, C. W. Moeckel, G. L. Yates and H. R. Wesson. Surg. Gynec. & Obst. **104**:287-294 (March) 1957 [Chicago].

Cystoscopic, cystographic, and manometric studies were performed in 15 patients treated by vaginal hysterectomy and repair. The patients were unselected except that, in 8, postoperative urethral catheter drainage was carried out and, in 7, postoperative trocar cystotomy drainage. Observations on these 15 patients indicate that after temporary postoperative atony of the detrusor the voiding contraction approaches preoperative levels by the 5th to 7th days. Postoperative bladder capacity is always less than before surgery. Spastic bladder phenomena are frequently associated with retention and residual urine. Postoperative urinary retention and associated voiding difficulties are most closely related to vesical neck obstruction; i. e., surgical overcorrection, urethral edema, and sphincter spasm.

In 100 of 200 vaginal hysterectomies indwellling urethral catheter drainage was carried out postoperatively and in the other 100 vaginal hysterectomies diversion of the urinary stream by means of trocar cystotomy was performed in the operating room. It was found that trocar cystotomy, as a form of temparary bladder drainage, is associated with a slight increase in morbidity, prolongation of initiation of voiding and of hospital stay postoperatively, increase in residual urine on discharge, and increase in frequency of late postoperative bladder symptoms. Direct complications of trocar cystotomy were bladder calculi (7 cases), hematuria (4 cases), and late rupture of bladder (1 case). Bladder calculi have recently been prevented by weak acid irrigations postoperatively. Trocar cystotomy drainage has the advantages of requiring less nursing care and increasing the patient's comfort. Trocar cystotomy drainage appears to be a valuable adjunct in the management of bladder dysfunction following vaginal hysterectomy, routinely or in selected cases in which a prolonged period of urinary retention is anticipated. General anesthesia was followed by a 20% higher morbidity than spinal anesthesia in the entire series of 200 cases. Trocar cystotomy appeared to circumvent the postoperative urethritis which is so often a distressing sequel to indwelling urethral catheter drainage.

Diagnostic Value of Puncture of Rectouterine Excavation (Douglas' Pouch) in Intra-abdominal Hemorrhage Caused by Extrauterine Pregnancy. E. Hermann. Zentralbl. Gynäk. **78**:700-706 (No. 18) 1956 (In German) [Leipzig, Germany].

At the hospital with which this author is connected, puncture of the rectouterine excavation has been used systematically for more than 2 decades, particularly for the differentiation of complications caused by extrauterine pregnancies from inflammatory gynecologic disorders. Puncture of the rectouterine excavation is of particular value because it reduces the number of exploratory laparotomies, and at the author's clinic an operation for a suspected ectopic pregnancy is almost never carried out without a diagnostic puncture of the rectouterine excavation. Exceptions to this rule are cases in which an ectopic pregnancy is either not suspected or a tubal rupture is clearly evident. The author believes that a diagnosis of a ruptured tubal pregnancy is made if puncture yields not only a relatively large quantity of blood but particularly if clots are present. The aspiration of a large quantity of blood always indicates a threatening condition; but the aspiration of only a small quantity, or a negative aspiration, does not necessarily rule out an extrauterine pregnancy. If the clinical findings are suggestive then the operation is performed even if the puncture yields no blood; otherwise the patient is carefully observed for 24 hours and then the puncture is repeated. The author does not resort to irrigation of the rectouterine excavation.

A total of 313 patients with suspected ectopic pregnancy were admitted to the author's clinic in the decade between 1946 and 1955, in some the suspicion of an ectopic pregnancy being raised only after admission. The diagnosis of an extrauterine pregnancy could be excluded in 20 of these patients on the basis of a thorough general and gynecologic examination. A puncture of the rectouterine excavation was done in 290 of the remaining 293. In 179 the puncture gave a positive result, an operation was performed in 176, and the extrauterine pregnancy was found in 164 of these women. Of the 3 not operated on 1 died during the examination as the result of hemorrhage; the other 2 were not operated on because the gynecologic examination did not indicate an extrauterine pregnancy despite the presence of blood in the rectouterine excavation. Tubal pregnancy was found in 162 (26 tubal ruptures and 136 tubal abortions) and omental pregnancies in 2 women. The 12 patients in whom the operation did not disclose an extrauterine pregnancy included 5 with a ruptured corpus luteum cyst, 2 with a ruptured follicular cyst, 1 with tubal tuberculosis, 1 with a uterine perforation resulting from curettage, and 1 with a perforated duodenal ulcer; in the remaining 2 the origin of the hemorrhage could not be ascertained. In 111 of the 290 patients puncture of the rectouterine excavation gave a negative result.

PEDIATRICS

Vaccinations Against Smallpox in Very Young Children. H. J. Doorschodt. Maandschr. kindergeneesk. 25:1-8 (Jan.) 1957 (In Dutch) [Leyden, Netherlands].

The author comments on the complications of smallpox vaccination, giving particular attention to postvacinal encephalitis. Changes in the regulations on vaccinations in the Netherlands have provided an opportunity to shed more light on the incidence of this serious complication. Evidence was obtained that it was much less frequent when the primary vaccination was carried out in children less than 2 years old than in older children. The aim of the studies presented here was to investigate whether smallpox vaccination could be successfully carried out at a very early age, that is, during the first 3 months of life. Studies were made on over 1,000 infants between 6 weeks and 1 year old. The efficacy of vaccination was ascertained by determining the antihemagglutinin and virus-neutralizing antibodies in the serum of the vaccinated child 3 weeks after the inoculation with smallpox vaccine.

It was found that the amount of antibodies present in infants less than 3 months old was on the average only slightly lower than in older children. The author concludes that if vaccination is performed carefully it is as successful in infants of less than 3 months than in older children. Furthermore, the vaccination of young infants has a number of advantages over that in older children: 1. The young child does not appear sick after vaccination, and this fact reduces the opposition of the public to vaccination. 2. The fact that the young child is alone in his cradle reduces the danger of spreading complications caused by the vaccine. 3. The danger of the postvaccinal encephalitis is very slight at this early age. 4. Contraindications such as the existence of eczema or exposure to acute infections is likewise less than later. 5. If smallpox vaccination is complete at 4 months of age, immunization against whooping cough, diphtheria, and tetanus can be begun.

Heat Regulation of the Premature Infant in Climatized Incubators: Improvement of Thermal Insulation of Incubators with Plexiglas Hoods. J. Gleiss. Ztschr. Kinderh. 79:147-157 (No. 2) 1957 (In German) [Berlin].

The following questions were investigated: 1. Do the rhythmical temperature fluctuations of climatized incubators with warm-air blowers influence the thermoregulation of permature infants? 2. How do the thermoregulating mechanisms of the incubator and the infant within it react to rapid changes in the surrounding room temperature? The dependence of the thermal regulation of the premature infant on that of the incubator becomes most clearly evident in the behavior of the infant's "internal" temperature (measured in stomach or rectum). Measurements demonstrated that the thermoregulation of premature infants is influenced by the rhythmical temperature fluctuation of incubators. The "internal" temperature of a premature infant reacts the more readily the more premature the child is. Changes in room temperature amounting to several degrees (Centigrade) influence the temperature in the incubator and with this that of the infant, in that the infant's "internal" temperature changes in the same direction (up or down) as does the room temperature.

It was found that inadequate insulation of the incubator hood is the essential cause of thermoability of the incubator and of the infant within it. In order to improve the thermal insulation of the incubators heated by warm air currents, it is suggested that an air-jacket be created by inserting a thin-walled plexiglas layer within the outer hood. To further reduce the thermal disturbances in closed incubators heated by warm air currents it is suggested that the opening admitting the warm air should be at the foot end rather than at the head end. The physician is responsible for any harm that a premature infant may sustain in an incubator. For this reason he must inform himself about the construction and the mode of operation of incubators so that injurious effects will be avoided.

Intrauterine Forms of Breathing. K. Dietel and V. Dietel. Ztschr. Kinderh. 79:203-210 (No. 2) 1957 (In German) [Berlin].

The term "maturation of the respiratory center, implies that lower forms of breathing (gasping and periodic breathing) become replaced by the normal rhythm of breathing. The more immature the fetus or child the greater is the tendency to lower forms of breathing. Gasping or snapping respiration, for instance, has been observed in fetuses delivered during the 4th month of gestation. Hiccup is a special form of snapping respiration, in which the diaphragm is lowered so the air is inspired in jerks. Periodic breathing of the Cheyne-Stokes type is most frequent during immaturity. The respiratory center in the medulla oblongata is an ontogenetic unit in which the lower centers such as those for the gasping or snapping form of breathing or for periodic breathing are being superseded or replaced by higher centers governing the normal rhythm of breathing. During the process of dying the ontogenetic processes in the composite respiratory center are reversed, in that the normal respiratory rhythm is replaced by periodic and this again by gasping respiration. The authors are concerned with the question as to what forms of respiration can be observed in the fetus in utero. Rhythmical, gliding, and wave-like movements can be observed in the region of the maternal umbilicus as pregnancy draws to the end. They are strongest in cases in which the chest of the fetus lies against the anterior wall of the uterus. The intrauterine respiratory movements can be seen, felt, or registered with Marey's capsule through the maternal abdominal wall.

In the investigations carried out by these authors the forms of respirations of the fetus in utero were compared with those observed in premature infants. The palpating hand differentiated between respiratory and body movements. Most of the tests were made at the end of pregnancy. Normal respiratory rhythm was observed most frequently. It generally continued for 2 to 5 minutes. The longest period during which the authors were able to register it was 13 minutes; then

the fetal chest turned somewhat, so that no further movements could be observed. The normal rhythm is interrupted by periods of arrest of varying length, but averaging 20 or 30 seconds. The longest intrauterine apnea lasted 2 minutes. Periodic breathing such as is observed in immature premature infants is characterized also in the fetus in utero by gradual decrease in the depth of breathing followed by respiratory arrest. Alternating changes between normal and periodic rhythm are frequent in utero. Pure hiccup was observed in one case 2 days before delivery, but otherwise this type of respiration is more frequent during the middle than toward the end of pregnancy. Why do forms of respiration occur before birth that occur only in the immature and during the decay of the respiratory center? In the fetus in utero the higher respiratory centers may interrupt their function. This also interrupts the inhibitions which are exerted by these centers on the lower centers. Thus lower forms of respiration may appear. Two different respiratory rhythms may show relative coordination in utero. Certain stimuli modify the automatism of the higher centers temporarily.

Conduct Disorders in Epileptic Children. F. Grunberg and D. A. Pond. J. Neurol. Neurosurg. & Psychiat. 20:65-68 (Feb.) 1957 [London].

Fifty-three epileptic children with behavior disorders were compared with 53 psychiatrically normal epileptic children in respect to organic, genetic, and social environmental factors. The 2 groups differed significantly as to their social environment. The epileptic children with behavior disorders had a more disturbed family background. The most significant social environmental factors were a disturbed emotional maternal attitude towards the child and experiences by the child of breaks and changes in environment. When 35 epileptic children with behavior disorders were compared with 35 nonepileptic children with the same behavior problems, the same adverse social environmental factors were found in both groups. The disturbed family background associated with conduct disorders in childhood epilepsy, whether causal or not, must be dealt with by combined medical and child-guidance techniques.

DERMATOLOGY

Rhythms in the Biologic Process in Normal and Abnormal Nails. A. Stühmer. Arch. klin. exp. Derm. 204:1-12 (No. 1) 1957 (In German) [Berlin].

In some patients with psoriasis rows of small pits arranged chain-like along the longitudinal ribs of the nail were observed. The development of these rows of pits suggests a periodicity in the process of psoriasis. The stimulus apparently acts on the proximal end of the nail matrix for only 2 or 3 days at a time. Then the nail growth is normal again, but after an interval of 28 or 30 days the stimulus that produces the pits recurs. Uninterrupted chains of these pits can be observed from the nail bed to the anterior rim of the nail. In patients with diffuse scleroderma, roof-shingle-like markings could be seen on the surface of the nails. These same changes, although somewhat less pronounced, were observed also on the nails of patients with psoriasis and on the nails of elderly persons without skin lesions. The author designates these structural changes in the nails as shingle-like onychodystrophy, and emphasizes that they suggest rhythmical changes in the growth of the nails.

Treatment of Tuberculosis of the Skin: According to Statistics of 369 Treated Cases from 1941 to 1956. C. Huriez and P. H. Pelce. Semaine hôp. Paris 33:571-580 (Feb. 14) 1957 (In French) [Paris].

A series of 369 patients with tuberculosis of the skin were treated during the last 15 years in the most phthisiogenic region of northern France. Lupus vulgaris was cured in 55% of the patients by a rotating treatment with antibiotics and calciferol. Isoniazid combined with streptomycin and calciferol resulted in the cure of all varieties of tuberculous lupus. Thanks to isoniazid, the healing rates of patients with tuberculosis of the skin, who scarcely responded to vitamins, improved greatly: 80% of those with initial lesions, 100% of those with verrucous forms, 75% of those with vegetative ulcers, and only 55% of those with scrofuloderma were healed, although isoniazid had been injected in situ. The necessity of a combined antibiosis with isoniazid as the essential element, of a prolonged use of the antibiotics for at least 1 year, and of complementary therapy with vitamin D_2 is emphasized. Further experiments showed a "cortisone-like" action of large doses of vitamin D_2. Good results were obtained in 20 patients, particularly in 6 with scrofuloderma, by corticotherapy combined with antibiotics. This treatment cannot be generally applied because of the risk of tuberculosis. It should be used only in patients, who do not respond to treatment with antibiotics and vitamins. An increase of the isoniazid level, after cortisone was given, was observed in a study of isoniazid metabolism, made in 250 blood tests. This proved the potentiating action of cortisone. The histological changes during treatment with antibiotics resulted in collagenous sclerosis, which is the final stage common to all healing processes. The authors emphasize the rotating therapy of antibiotics and vitamin D_2. The general trend in the treatment of infectious lesions is to combine specific with nonspecific agents.

OTOLARYNGOLOGY

Antibiotic Deafness. O. Popper. South African M. J. 31:54-56 (Jan. 19) 1957 [Cape Town, South Africa].

The author reports on 93 patients with antibiotic deafness. Wide incisions of the posterior quadrant of the ear drum were made. The discharge was tenacious and viscid in 1 patient, in whom fluid in the middle ear had persisted for months, and the author had to incise 5 times. Incision was made three times in 7 and twice in 17 patients. This treatment was insufficient for 18 patients. Drainage of the attic and antrum tympanicum cleared the condition of these patients

completely. The method used was an endaural transtympanic atticoantrostomy. An acute otitis media is not necessarily cured by the administration of antibiotics. Antibiotic deafness is due to the retention of fluid in the middle ear after acute otitis media treated with antibiotics. Conductive deafness may be caused by the large doses of antibiotics, which act rapidly (within 24 hours), arresting inflammation. The retained fluid becomes sterile and the capillaries are not stimulated to dilate and absorb this fluid. This is likely to become reinfected. The infection may be latent in the attic and antrum. Treatment should be as conservative as possible. It varies from simple incision to more extensive measure.

Bronchogenic Carcinoma: Diagnostic Aspects of 228 Proved Cases. C. H. Steele. Laryngoscope **67**:137-146 (Feb.) 1957 [St. Louis].

Of 228 patients between the ages of 31 and 80 years with proved bronchogenic carcinoma, 200 were men and 28 were women. The diagnosis was established by biopsy, exploration, or autopsy. A positive diagnosis was made by bronchoscopic biopsy in 92 (40.4%). Two hundred four (89.9%) of the 228 patients smoked; 150 (65.7%) smoked 20 or more cigarettes daily, or an equivalent amount of pipe or cigar tobacco, for periods ranging from 20 to 45 years. Two hundred three patients (89%) were city dwellers and lived in an environment in which the atmosphere contained varying amounts of possible carcinogenic dusts, gasses, fumes, and chemicals. Sixty-five per cent of the group worked indoors, and 35% worked predominantly outdoors. Examination of operative or autopsy specimens revealed squamous cell carcinoma in 103, undifferentiated carcinoma in 77, and adenocarcinoma in 48. While only a small percentage of the epidermoid and undifferentiated carcinomas occurred in women, a more nearly equal distribution was found in adenocarcinoma.

The cardinal symptoms of bronchogenic carcinoma in order of frequency were cough, lingering respiratory symptoms after influenza, chest cold or pneumonia, chest discomfort or pain, dyspnea, and hemoptysis. The average duration of symptoms from onset to positive diagnosis was 7.6 months. The average delay from the first medical consultation to positive diagnosis was 3.1 months. Signs of endobronchial obstructions were the most common physical signs. Roentgenograms of the chest proved to be the most valuable single means of obtaining a presumptive diagnosis of pulmonary cancer. Two hundred twenty-one patients (97%) were suspected by the roentgenologist to have bronchogenic carcinoma. Bronchoscopy was of value in establishing the diagnosis of bronchogenic carcinoma by visualization and biopsy of the lesion and by permitting bronchial lavage of selected areas of the pulmonary tree for cytological examination. Bronchoscopy was also an aid in determining operability based on the presence or absence of anatomic-pathological changes in the tracheobronchial tree suggestive of bronchogenic carcinoma.

Cytological study of bronchial aspirate specimens, after bronchial lavage, was done in 61 patients. The presence of malignant cells was noted in those obtained from 29 (47.5%) of the 61 patients. A high percentage of bronchial aspirates containing malignant cells was revealed by the cytological study of specimens obtained by abrasion of the bronchial wall with bronchoscopic forceps or aspirator followed by forceful washing of such areas with sodium chloride solution. With increased experience, a positive diagnosis of bronchogenic carcinoma was made by cytological examination of bronchoscopically recovered secretions in 55.5%, while such a diagnosis was made with the aid of forceps biopsy in 25.9%.

Intubation Granuloma. S. S. Epstein and P. Winston. J. Laryng. & Otol. **71**:37-48 (Jan.) 1957 [London].

Intubation granuloma is a complication of endotracheal anesthesia that is becoming more frequent due to the increasing use of intubation. There is no doubt that the condition is far more common than the 55 cases collected from the literature would indicate. The data on these 55 cases are tabulated and the authors present findings on 10 additional cases observed in a London hospital between 1948 and 1956. A few of these patients were referred to the staff of this hospital following operation elsewhere. Six of the 10 patients had unilateral and 4 had bilateral lesions. Hoarseness is the presenting symptom in most patients. Respiratory obstruction may occur if the granuloma is large and especially if bilateral. Emergency removal may be necessitated on this account. The diagnosis is easily made in a patient who complains of persistent postoperative hoarseness. Intubation under direct vision with the smallest possible tube, use of muscular relaxants, avoidance of too light a plane of anesthesia during induction, and prevention of excessive flexion of the neck during operation have been suggested as prophylactic measures, but the authors regard their value as debatable. They believe that the Magill tube by virtue of its shape and resilience must be held responsible for pressure necrosis in the region of the posterior commissure and occasionally on the anterior tracheal wall. Dwyer strongly recommended a tube curved in two planes to achieve greater conformity with the natural shape of the air passages.

As intubation granuloma originates from an abrasion of the vocal process, there is little doubt that early recognition of postintubation laryngeal damage will minimize the risk of subsequent granuloma formation. Hoarseness peristing more than 2 days after an operation in which intubation was performed is a clear indication for laryngoscopy. Should there be any ulceration of the vocal process, absolute vocal rest until complete healing occurs is probably the most important single factor in the prevention of intubation granuloma. Removal of a sessile intubation granuloma exposes a large bare area which will gradually heal by granulation, possibly with recurrence of granuloma formation.

The Clinical Significance of the Ramification of the Recurrent Laryngeal Nerves: A Critical Anatomical Study. H. Pichler and A. Gisel. Laryngoscope **67**:105-117 (Feb.) 1957 [St. Louis].

In 1948, King and Gregg studied the reasons for the various behaviors of the vocal cords after partial or total paralysis of the recurrent laryngeal nerves occur-

ring after thyroidectomies and other operations of the throat or after traumas of the neck. These American workers emphasized the clinical significance of an extralaryngeal division of the recurrent laryngeal nerve into anterior and posterior branches, which according to their statement "offers the only rational explanation of all lower motor neuron vocal cord paralyses." King and Gregg's report induced a series of studies carried out by the authors at the Anatomical Institute in Vienna. One hundred dissected recurrent laryngeal nerves were prepared; 40 preparations were made in situ, and later 60 were done on isolated larynges. Extralaryngeal divisions were found in all of the 100 nerve preparations on microscopic examination. The extralaryngeal division of the recurrent nerve was identified as a division in motor and sensory fibers. It occurred at the level of the first, second, or third tracheal cartilage. At the point of the bifurcation the recurrent nerve gave off a sensory branch which was distributed to the mucosa of the hypopharynx, then split and subdivided, forming an anastomosis between the inferior and superior laryngeal nerves. It thus constituted the caudal portion of Galen's loop.

This nerve was located on the cricoarytenoideus posterior muscle. In every instance, the ramus posterior proper branched off only endolaryngeally. The division of the inferior laryngeal nerve into the posterior ramus (the mesial branch) and the anterior ramus (the lateral branch) occurred in all cases about 1 cm. above the lower edge of the cricoid cartilage. The ramus posterior proper was located below the cricoarytenoideus posterior muscle, between the muscle and the perichondrium. The authors could not trace any low extralaryngeal division of the recurrent nerve into abductor and adductor branches, respectively, but the presence of this anatomic condition constitutes an essential requirement of the King-Gregg hypothesis. Since most workers express serious doubts concerning the motor innervation of Galen's loop, one must caution against overrating the clinical importance attributed to the presence of an extralaryngeal motor ramus posterior to the recurrent nerve. There are serious reasons to doubt that the problem of the baffling behaviors of the vocal cords after thyroidectomy has as yet been satisfactorily solved by the explanation offered by King and Gregg.

PATHOLOGY

Statistical Findings and Considerations on Tumors Observed Between 1945 and 1954. P. Aresu Rass. med. sarda **58:**33-53 (Jan.-Feb.) 1956 (In Italian) [Cagliari, Italy].

In 1,914 autopsies performed between 1945 and 1954, 171 tumors were found, of which 26 were benign and 145 malignant. Benign tumors were most frequent among patients 40 to 50 years old and malignant tumors among patients 40 to 70 years old and especially among patients in the 60's. The connective tissue and the urogenital apparatus were the most frequent location for benign tumors; the greatest number of malignant tumors were of epithelial origin and occurred most frequently in the digestive tract, followed by the urogenital tract, respiratory tract, and the lymphatic system. Most of the benign urogenital tumors were fibromas of the uterus; these were followed by fibroadenomas of the breast. The order of frequency in the location of the malignant tumors of the digestive tract was: the liver (mainly cancrocirrhosis), stomach, bile ductus, pancreas, rectum, small intestine, palate, tongue, and esophagus. Malignant tumors of the urogenital apparatus were located most frequently in the kidney and the uterus, followed by the bladder, prostate, and ovary. Almost all tumors of the nervous system were gliomas and were mainly found in the cerebellum and in the frontal and parietal cerebral lobes. All the malignant tumors of the respiratory tract occurred in the lungs except for 1 in the pleura and 1 in the larynx. The tumors of the skeleton and of the lymphatic apparatus were all of mesenchymal origin.

Analysis of the findings in specimens from 5,433 biopsies performed in the same decade revealed the presence of tumor in 2,184, of which 1,509 were malignant and 675 benign. Malignant tumors were most frequent among patients 40 to 70 years old. More specimens, both malignant and benign, were from women than from men. The location in order of frequency for benign tumors was the urogenital tract, breasts, digestive tract, skin, nervous system, and respiratory tract; for malignant tumors it was the urogenital tract (427), digestive tract (382), respiratory tract (131), lymphatic system (113), skin (98), skeleton (46), sensory organs (39), endocrine glands (14), muscles (7), nervous system (5), and the hemopoietic organs (1). The origin of 335 tumors, 89 benign and 246 malignant, could not be established.

The Clinical Value of Urinary 17-Ketogenic Steroid Determinations. M. J. Levell, F. L. Mitchell, C. G. Paine and A. Jordan. J. Clin. Path. **10:**72-79 (Feb.) 1957 [London].

The normal range of urinary 17-ketogenic steroids was established from assays on 182 persons ranging in age from 3 to 101 years. The values show a rise during childhood, boys and girls having apparently identical ranges up to the age of 15 years, after which the level in boys rises to a higher average than that in girls. Between the ages of 20 and 40 years the geometric mean for men, 12 mg. per day, is significantly higher than that for women, 9.3 mg. per day. At any age the values for either sex seem to be better represented by a log-normal distribution than by a normal one, and for this reason the geometric means are given. In later life the excretion of 17-ketogenic steroids in men appears to decline. The values for women do not show a similar decline.

The authors also present the values found in the following conditions: adrenal cortical hypofunction, myxedema, hypopituitarism, pituitary basophilism, the adrenogenital syndrome, hirsuties, diabetes, thyrotoxicosis, amenorrhea, rheumatoid arthritis, and obesity. The normal values observed in some patients with adrenal cortical hypofunction and pituitary basophilism and the unexpectedly high values found for adrenal steroids in some patients with pituitary insufficiency illustrate clearly the dangers of placing too much reliance on single determinations. The limits of

the normal range are wide, so that a person's 17-ketogenic steroid excretion may vary greatly without reaching a value which would be regarded as abnormal. In this respect, the status of the 17-ketogenic steroid assay is similar to that of the 17-ketosteroid estimation. These observations emphasize the desirability of performing an adrenal function test wherever indicated. The high values found in the patients with virilizing adrenal hyperplasias suggest a block in the biosynthesis of 17-hydroxycorticosterone with consequent overproduction of the precursor, 17-hydroxyprogesterone. As this substance does not adequately suppress the pituitary production of corticotropin, the effect is to produce adrenal hyperplasia, and, although 17-hydroxyprogesterone is not in itself ketogenic, it is probably converted in part to a 17-ketogenic steroid.

The potentialities of the 17-ketogenic steroid assay in diagnosis and control of treatment are best studied by comparison with the 17-ketosteroid assay. In most of the conditions considered, as far as single estimations are concerned, the two methods yield about the same amount of information as judged by the extent of the departure from normal. In patients suspected of having the adrenogenital syndrome it is advantageous to have both assays performed, but in general it would seem that one would suffice. In view of the undoubted advantage of the 17-ketogenic steroid assay in following changes in adrenal function, as evidenced by corticotropin tests, by treatment of patients with hypothyroidism, and by response to stress, this is the assay of choice.

INDUSTRIAL MEDICINE

The Treatment of Tetraethyl Lead Poisoning. R. R. Boyd, G. Walker and I. N. Henderson. Lancet 1:181-185 (Jan. 26) 1957 [London].

Tetraethyl lead is a highly toxic liquid that is blended with gasoline. This organometal compound is absorbed through the skin and the respiratory and alimentary mucosa. It is probably distributed in a nonionic form, and, being lipid-soluble, it is concentrated in the brain, body fat, and liver. Its toxicity is due to its lead content, and, because of selective uptake, manifestations of poisoning are dominated by involvement of the central nervous system and differ from those of inorganic lead poisoning. Although the inhalation of tetraethyl-lead vapor for a brief period may be fatal, the continued excretion of large amounts of lead in the urine for some time after the removal of symptomless workers from prolonged minor exposure suggests that appreciable quantities of tetraethyl lead may be absorbed and the lead stored in a relatively nontoxic form. Three moderately severe cases of poisoning are described in this report, and a 4th case with a severe psychosis is mentioned. These 4 cases involved men who worked for 6 weeks cleaning underground tanks that had contained leaded gasoline. The affected men scraped the deposit containing tetraethyl lead from the floors and sides of the tank and shovelled it into buckets, which were hauled to the surface and emptied into pits. They were provided with protective clothing and equipment, but they neglected to adhere strictly to the prescribed precautions. During the period in hospital, urine was collected daily for estimation of lead, coproporphyrin, and creatinine. In addition lead analysis was performed on daily fecal samples and on blood samples taken frequently.

Three of the patients were treated in turn for 3-day periods with edathamil calcium disodium in doses of 1 Gm. per 30 pounds of body weight per day, given intravenous drip lasting 4 to 6 hours, with 300 mg. of penicillamine 3 times a day by mouth and with 1 Gm. of edathamil calcium disodium by mouth 4 times a day. Intervals of several days were allowed between the different forms of treatment, and each treatment was preceded by 2 control days during which urine, feces, and blood were collected for analysis. The men were confined to bed for the first few days and received amobarbital as a sedative. A high fluid intake and full diet were encouraged. After discharge from the hospital, examinations and analyses were carried out at weekly intervals. Edathamil calcium disodium was given in 1 Gm. doses 4 times a day by mouth for alternate weeks until the clinical condition was satisfactory and the lead excretion normal. They, then, took up work that did not involve exposure to toxic hazards.

Edathamil calcium disodium is the monocalcium disodium complex of ethylene diamine tetra-acetic acid. It is a chelating agent that combines with metallic ions forming nonionized, biologically inactive compounds. It has revolutionized the treatment of lead poisoning. Penicillamine ($\beta\beta$ dimethyl cysteine) like dimercaprol contains 2 thiol (–SH) groups per molecule. It increases the urinary excretion of copper in normal subjects and in patients with hepatolenticular degeneration as effectively as does dimercaprol. It was used in these patients to increase lead excretion, but it had little effect in this respect. While the urinary lead excretion was increased sevenfold by the intravenous injection of edathamil calcium disodium, it was influenced little by the oral administration of this drug or of penicillamine. The 4th patient who had mania, hallucinations, and delusion responded favorably to electroconvulsion therapy.

Delayed Death Caused by Gassing in a Silo Containing Green Forage. F. M. Troisi. Brit. J. Indust. Med. 14:56-58 (Jan.) 1957 [London].

A youth of 18 years of age and a boy of 12 descended into a silo on a small farm in Italy. The silo was of cement, cylindrical in shape, 6 meters (19 ft.) high and about 4.5 meters 14 ft. in diameter, and about half its height was buried in the ground, with only one opening in the roof, which was closed with a metallic cover. Green forage, mixed with beans, barley, and oats had been preserved in the silo, which had been nearly empty for about a month, with the cover in place. The 2 youths entered the silo to remove the remaining silage. Shortly after reaching the bottom of the silo they became unconscious. A man of 61 standing nearby went into the silo to help them, and he also lost consciousness. All 3 were dragged out, and artificial respiration was applied. The 2 youths were already dead. The man was immediately taken to the nearest clinic. He appeared to be in extremis; the only sign of life was intermittent cardiac contractions. Artificial respiration was started at once,

and cardiac and respiratory stimulants were given together with 500 ml. of plasma intravenously. After about an hour a few spontaneous respirations began, and in about 10 minutes tachypnea developed. Consciousness was not regained at any time. After 5 hours he was admitted to hospital completely unconscious. This man died on the 5th day, despite the administration of oxygen, respiratory stimulants, and repeated blood transfusions preceded by bleeding. The clinical findings were those of asphyxia with delayed death due to carbon dioxide intoxication and perhaps to anoxemia also.

It should be remembered that carbon dioxide may accumulate in silos, whether they contain forage or grain. The type of silo described above, half-buried in the ground and with a single opening in the roof, should be prohibited. All silos should be provided with a free opening at the base. Underground tanks and vats must be actively ventilated before they are entered, and the person entering such a chamber must be secured by a rope and be observed from outside. When it is necessary to enter a chamber where the presence of carbon dioxide is known or suspected, it is essential to use breathing apparatus that draws air from outside the chamber. Posters may be displayed at farms indicating the dangers and the necessary preventive measures. Methods for testing enclosed atmospheres for the presence of carbon dioxide and sufficient oxygen are to lower lighted candles or small caged animals into the chamber.

Decompression Sickness During the Sinking of a Caisson: A Study of Some Factors in the Pathogenesis of Caisson Disease. H. E. Lewis and W. D. M. Paton. Brit. J. Indust. Med. **14**:5-12 (Jan.) 1957 [London].

Most of the studies of decompression sickness have been made during the construction of tunnels. The sinking of a caisson, however, involves certain special features not encountered in tunnel work. This paper describes an investigation into the incidence of decompression sickness during the sinking of reinforced concrete caissons. In the period during which the pressure exceeded 18 lb. per sq. in., there were 79 cases of bends affecting 37 men in a total number of 1,800 compressions at the inlet caisson. At the outlet caisson there were another 10 cases in 310 decompressions. This gives a total incidence of about 4%. The incidence of bends began to rise when the pressure exceeded 20 lb., then rose to a high level for a brief period, and tended to fall thereafter even though the pressure was maintained. This almost "epidemic" character of decompression sickness is a very common feature. Bends consisted of aching pains most commonly affecting the joints. The legs were the most frequently affected and next the arms. The knees, wrists, shoulders, head, and the body in general were also affected. A few workers were repeatedly victims of mild bends, and 2 had as many as 6 attacks each.

Among the contributory factors to what was a rather high rate of decompression sickness were: (1) inaccuracy in following the prescribed decompression procedure; (2) accumulation of carbon dioxide in the blister lock in which decompression took place; (3) vigorous muscular exercise immediately before the decompression, due to the ascending 70-ft. ladder; (4) chilling because of the temperature difference between the hot face and the cold decompression chamber. It is recommended that lock-keepers be properly trained and given sufficient authority for their task, that a recording barograph be attached to any chamber in which decompression of men takes place, that the blister lock be ventilated or "cleared" during decompression, and that the men wait for 10 minutes after climbing the caisson ladder before entering it so that their carbon dioxide production will have decreased to resting levels. This waiting period will also tend to reduce the effect of exercise in predisposing to bends. If possible, dry clothes should be put on before entering the decompression lock, and the lock should be kept warm during decompression.

PUBLIC HEALTH

The Reported Incidence of Glandular Fever: An Analysis of a Report of the Public Health Laboratory Service. K. W. Newell. J. Clin. Path. **10**:20-22 (Feb.) 1957 [London].

In recent years pathologists in public health and hospital laboratories in England and Wales have been voluntarily making weekly reports on infectious diseases diagnosed in their laboratories to the director of the Public Health Laboratory Service. Infectious mononucleosis is on the list of diseases for which reports are made. In 1955 pathologists were asked to give the age, sex, and occupation of the patient for for each case diagnosed. Though about 98% of the hospital and public health laboratories in England and Wales take part in the reporting, it does not necessarily follow that every laboratory invariably reports cases of infectious mononucleosis. In a preliminary study in 1954 efforts were made to obtain detailed information on the titers obtained in the Paul-Bunnell test and on whether or not absorption tests were made, but the interpretation of reports from so many different pathologists was difficult, and in the main study in 1955 pathologists were only asked to state whether they based their diagnosis on the results of serologic or hematological tests or both.

In 1955 pathologists reported 1,861 cases of which 1,769 were diagnosed serologically, alone or in conjunction with blood or clinical examinations, and in 92 findings were similar to those of infectious mononucleosis clinically and hematologically, but serologic findings were negative. The analysis deals only with the 1,769 serologically confirmed cases. It was found that 50% of the cases were in children under 15 years of age, but only 39% of those in persons between 15 and 19 were in males. Infectious mononucleosis in adults was more frequent during the summer, whereas in children under 15 there was no seasonal peak, the distribution being about the same throughout the year. Attack rates seemed to be higher in the south of England than in the north. From the records on the occupations of 62% of the patients between 16 and 34 years, it appeared probable that occupational differences could be explained by the accessibility of diagnostic facilities. The age groups with the highest incidence appeared to be similar in a number of different occupations.

BOOK REVIEWS

The Early Detection and Prevention of Disease. Edited by John P. Hubbard, M.D., George S. Pepper Professor of Public Health and Preventive Medicine, University of Pennsylvania School of Medicine, Philadelphia. Cloth. $7.50. Pp. 350, with 2 illustrations. Blakiston Company (division of McGraw-Hill Book Company, Inc.), 330 W. 42nd St., New York 36; 95 Farringdon St., London, E.C.4, England; 253 Spadina Rd., Toronto 4, Canada, 1957.

Some 28 contributors, working in a variety of fields, have attempted to set down as briefly as possible the salient points in disease prevention. It is surprising, considering space limitations, how much that is of factual importance they have succeeded in presenting. Not all diseases could be considered, but the major ones seen in daily practice are broadly viewed. Most diseases enter the body via the respiratory or alimentary systems. This is especially true in the case of young children, adolescents, and adults up to 45 years of age. Older people are more likely to suffer from metabolic disturbances. Chapter 15, by Klaus Hummeler, deals with viral diseases of the respiratory tract, especially influenza. In 1933, an influenza virus was first isolated and identified as a specific pathogen. Seven years later, an "A" and a "B" strain, quite different from each other in many respects, were recognized. Since then a "C" and possibly a "D" (Japanese) strain have been studied. Vaccines made from various strains are only partially successful. The antibiotics effective against some viruses have little or no effect against this disease. Owing to great changes in the character of strains, vaccines have to be modified from time to time. Under optimal conditions the incidence of influenza may be reduced about 90% (less for influenza "B") by vaccination.

Cancer of the lung is the subject of chapter 16, by Katherine R. Boucot, who avoids any extensive allusion to smoking as a cause, save to say that in the light of present knowledge, cutting down on excess is merely common-sense management for all smokers. Men over 45 years of age who have a distressing chronic cough, hemoptysis, unilateral wheeze, and weight loss are suspect, and should be carefully studied. Even so it may then be too late. In patients with frequent coughs and colds, a roentgenogram of the chest should be made every six months. Early detection and prevention of tuberculosis is the theme of a chapter by David A. Cooper. We are now able to diagnose early infection of the lungs by clinical, laboratory, and x-ray studies. Aminosalicylic acid and isoniazid are valuable drugs, and with their use, the incidence of tuberculosis continues to decline, but the disease is still far from being eradicated. For about 20 years, surgery of the lung has progressed, but it is applied chiefly in advanced cases. Since tuberculosis is directly transmitted from an infected to a well person, normal social contacts will always make eradication of the disease difficult. An introductory chapter on the changing scene and a later chapter on the prevention of first-attack rheumatic fever were written by the editor. He states that in every case of rheumatic fever we should search for the Streptococcus pyogenes. To examine a throat and simply report it as "very red" without taking a culture is poor procedure and may jeopardize a patient's future health. There is much more of interest and profit to the reader in this excellent symposium. The paper and print are excellent.

Fortschritte der Serologie. Von Dr. Hans Schmidt. Second edition. Artificial leather. 150 marks. Pp. 1114; XXIII, with 87 illustrations. Verlag Dr. Dietrich Steinkopff, Holzhofallee 35, (16) Darmstadt, Germany, [1950-1955].

The first edition of this important work appeared in 1933, and the present edition represents an effort to assimilate the immense number of contributions that have been made in the field of serology since that time, in both Europe and America. Issued in 18 installments, the book is now complete and totals 1,117 pages. The six major divisions deal with antigens, antibodies, the antigen-antibody complex, the formation of antibodies, indirect and secondary effects of the antigen-antibody reaction, and special serologic reactions. The first division may be taken as an example of the comprehensiveness of the work. It contains sections on specificity and the haptene concept, proteins in general, the specificity of proteins, chemically altered proteins, artificially conjugated antigens, carbohydrate-protein combinations, serologic experiments with chemically marked antigens, reactions of simple compounds of known composition, the limits of specificity, microbial antigens, bacterial toxins and animal poisons, heterogenetic antigens and antibodies, viruses, and phages. The other five divisions of the book are equally detailed and comprehensive.

Especially to be commended is the author's plan of disposing of his topics in units of a few pages, so that each unit is followed at once by its bibliography and so constitutes a compact and coherent entity. Abbreviations and other special terms are defined and used freely within the unit but are not carried over into remote parts of the text; it is therefore easy to find a complete and intelligible discussion of each topic, so that the book is unusually convenient for quick reference. The bibliography is copious and accurate, and an appendix issued with the last installment brings the work up to date on such subjects as localization of antigens, effects of ionizing radiations on antibody production, the antitoxic immune globulins, transfer of passive immunity from mother to fetus, coproantibodies, experimental organ-antibodies, autoantibodies, antibody production in tissue cultures, and properdin. The author and subject indexes have been prepared with care, and the printing is flawless. This book will be indispensable in any library used by immunologists, serologists, and clinical pathologists.

These book reviews have been prepared by competent authorities but do not represent the opinions of any medical or other organization unless specifically so stated.

A Text-Book of Gynaecology for Students and Practitioners. By James Young, D.S.O., M.D., F.R.C.O.G., Consulting Gynaecologist, Royal Infirmary, Edinburgh. Tenth edition revised in collaboration with J. C. McClure Browne, F.R.C.O.G., F.R.C.S.E., Professor of Obstetrics and Gynaecology, University of London, London. Cloth. $9. Pp. 253, with 302 illustrations. The Macmillan Company, 60 Fifth Ave., New York 11, 1956.

This edition appears only two years after the previous one. There are two new chapters, one on schistosomiasis (bilharziasis) and the other on syphilis, granuloma inguinale, and lymphopathia venereum. Several chapters have been rewritten, the text has been revised, and several new illustrations have been added. The authors are not enthusiastic about plastic operations on the oviducts, in spite of the recent extensive literature on this subject. They point out that only the smallest doses of estrogens should be used to overcome menopausal symptoms. They emphasize that uterine bleeding may occur after the use of estrogens, but they maintain this is produced if the dosage has been somewhat too large and is stopped because of nausea. They fail to warn their readers to use the estrogens intermittently and not continuously for long periods of time.

The section on operative gynecology is most inadequate and perhaps should have been omitted. It occupies only 33 pages. Eleven illustrations depict instruments but only two portray vaginal hysterectomy. One shows subtotal hysterectomy and one the complete hysterectomy for cancer of the cervix. There are very few references in this book. In spite of these minor criticisms, the book is outstanding. Its popularity and usefulness are attested to by the 10 editions since 1921. This edition, like its predecessors, should prove helpful to students and practitioners throughout the world.

Sequeira's Diseases of the Skin. By John T. Ingram, M.D., F.R.C.P., Physician in Charge, Skin Department, General Infirmary, Leeds, and Reginald T. Brain, M.D., F.R.C.P., Physician in Charge, Skin Departments at Royal Free Hospital and Hospital for Sick Children, Gt. Ormond Street, London. Sixth edition. Cloth. $18. Pp. 843, with 489 illustrations. The Macmillan Company, 60 Fifth Ave., New York 11; J. & A. Churchill, Ltd., 104 Gloucester Pl., Portman Sq., London, W. 1, England, 1957.

The authors of this sixth edition of a well-known English textbook are former students of the late Dr. Sequeira. Ten years have elapsed since the appearance of the previous edition. In view of the marked advances in dermatology during this period, extensive changes have been made in the book and many chapters have been completely rewritten. Nevertheless, the volume adheres to the same stereotyped pattern of presentation as its predecessor. The general range of skin diseases is covered in detail and the descriptive writing is simple and straightforward. Therapeutic procedures are described adequately, although many of the newer ideas, drug information, and techniques are merely enumerated or briefly discussed. The adherence of the authors to the formalized and didactic presentation of material has a slightly stultifying effect on the reader. The illustrations are clear and in general serve to amplify the text, but a number of the older photographs could have been deleted without detracting from the volume. The present edition should continue to serve as a reliable and conservative guide to students and practitioners interested in the subject, although the volume is not nearly as comprehensive and illuminating as some of the other recent textbooks in this field.

Mental Health Administration. By Jack R. Ewalt, M.D., Commissioner, Massachusetts Department of Mental Health, Boston. Cloth. $5.50. Pp. 168. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto, 2B, Canada, 1956.

The administration of mental health institutions is no longer considered a job that anyone can do with good intentions but little knowledge or experience. Today, in fact, there is an accrediting body that certifies psychiatrists for this position. The commissioner of the Massachusetts Department of Mental Health has here written a small volume dealing with administration of mental health departments, community mental health programs, mental health centers, and mental hospitals. In this book there are numerous practical recommendations concerning the mundane aspects of administration derived from the author's own varied experiences. With all the details, and these certainly not complete, there is a noticeable absence of an explicit philosophy and a sense of values. True, the details must be learned and applied to myriad problems, but without a value system they are applicable to institutions and not to the human being who is sick and suffering. The clothing requisites per 1,000 patients per year or the number of domestics in a special type of school may be significant for the concept of organization but are irrelevant to the treatment goals unless the meanng of all services is oriented to the specific ends. Therefore, this is not a good reference book but a manual of operations for those who need to know the means but not the end.

Pregnancy and Birth: A Book for Expectant Parents. By Alan F. Guttmacher, Director of Gynecology and Obstetrics, Mt. Sinai Hospital, New York. [Some of material in this book appeared in different form in author's book "Into This Universe."] Cloth. $4.50. Pp. 335, with drawings by Anthony Ravielli. The Viking Press, Inc., 625 Madison Ave., New York 22; Macmillan Co. of Canada, Ltd., 70 Bond St., Toronto 2, Canada, 1956.

This book provides an answer to the inquisitive mind of the modern mother. It cannot be compared with any previously published manual for expectant parents, as it is truly a textbook of obstetrics written in terms that the average lay person can comprehend. It goes into much greater detail than any previous volume written for the expectant parent. The author has made a definite effort to be precise and to explain frequently used medical terms in language that can be easily understood by the nonmedical public. The book is written in his characteristically clear and interesting style, so that one can easily read this book from cover to cover.

Present-day emphasis on knowledge about pregnancy and reproduction has been far in advance of the literature available for the lay public. Therefore, this book will provide answers to those expectant parents who desire more than superficial information. It will probably serve a more important purpose as a reference for those wishing medical information in terms that are easily understood. The index is extremely complete and contains medical headings, as well as terms frequently used by the laity. This book can be highly recommended to expectant parents.

Occupational Therapy: Principles and Practice. By William Rush Dunton, Jr., M.D., and Sidney Licht, M.D. Second edition. Cloth. $8. Pp. 373, with 17 illustrations. Charles C Thomas, Publisher, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, Ltd., 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto, 2B, Canada, 1957.

Extensive revisions have been made in this new edition of a leading book in its field. Especially to be noted is the revision of the chapter on upper extremity amputees. Emphasis is placed not only on the types and working mechanisms of a variety of prosthetic devices but also on details of retraining the amputee from the physical and psychic standpoints. Other major changes involve the sections on occupational therapy for children, bibliotherapy, and psychotherapy. The chapters on drama in the first edition have been replaced by those on the role of music and recreational therapy (games). The chapter on occupational therapy in tuberculosis could have been shortened, in view of therapeutic advances and shorter sanatorium care. Throughout the book careful attention is given to the need for physician-supervised occupational therapy departments and the need for close teamwork in treating patients requiring rehabilitation.

Clinical Use of Radioisotopes. By William H. Beierwaltes, M.D., Associate Professor of Internal Medicine and Coordinator, Clinical Radioisotope Unit, University Hospital, Ann Arbor, Mich., Philip C. Johnson, M.D., Assistant Professor of Internal Medicine and Chief, Radioisotope Unit, Veterans Administration Hospital, Oklahoma City, and Arthur J. Solari, B.S., M.S., Instructor in Radiation Physics, Department of Radiology, University Hospital, Ann Arbor. Cloth. $11.50. Pp. 456, with 126 illustrations. W. B. Saunders Company, 218 W. Washington Sq., Philadelphia 5; 7 Grape St., Shaftesbury Ave., London, W.C.2, England, 1957.

This textbook is eminently suited for the beginner in the use of radioisotopes. Its major assets are a uniformly high level of clinical judgment and the presentation of technique in recipe style, in such detail that a novice with skill in general laboratory work may expect to use isotopes successfully. Included in this recipe style are detailed descriptions of virtually every isotope tracer technique in clinical use. The coverage of physics is somewhat less satisfactory, being marred not only by a failure to convey the intended meaning but also by typographical errors, as in the exponentials, which will serve only to confuse the beginner. The section on physics in relation to health is, however, well done. The chapters on the clinical uses of radioiodine are especially useful.

Muscle Relaxants in Anesthesiology. By Francis F. Foldes, M.D., Director, Department of Anesthesia, Mercy Hospital, Pittsburgh. Publication number 294, American Lecture Series, monograph in Bannerstone Division of American Lectures in Anesthesiology. Edited by John Adriani, M.D., Director, Department of Anesthesia, Charity Hospital, New Orleans. Cloth. $5.50. Pp. 210, with illustrations by Margaret M. Croup. Charles C Thomas, Publishers, 301-327 E. Lawrence Ave., Springfield, Ill.; Blackwell Scientific Publications, 24-25 Broad St., Oxford, England; Ryerson Press, 299 Queen St., W., Toronto 2B, Canada, 1957.

The muscle relaxants were introduced into clinical practice about 15 years ago. This book summarizes the laboratory and clinical experience that has accumulated since that time. It is informative, yet not overwhelming in detail. The author appears biased in favor of succinylcholine, but perhaps this attitude is justified. The statement is made that "when employed judiciously, cognizant of their pharmacological effects, other than those exerted at the neuromuscular junction, the muscle relaxants will increase rather than decrease the safety of the patient." It is doubtful that evidence is yet available to justify this conclusion. Occasional errors in spelling are surprising, for example, "afferant" and "thiopenthal." The format is attractive, and the book can be recommended to those studying as well as those practicing anesthesiology.

Out of the Test Tube: The Story of Chemistry. By Harry N. Holmes, Ph.D., LL.D. Fifth edition. Cloth. $4.50. Pp. 313, with 102 illustrations. Emerson Books, Inc., 251 W. 19th St., New York, 1957.

This book is intended to interest the layman in chemistry and to make him more appreciative of the part this science plays in daily life. The various chapters make light, interesting reading, for the author chooses his examples from experiences familiar to everyone. The author covers briefly such topics as chemical warfare, hydrogen, water, inert gases, insects, dyes, sugar, and fats. It is doubtful whether the physician would find much in the book that is new. The last edition appeared in 1943. The facts and figures have been brought up to date, but otherwise the book is little changed from the previous edition. A chapter on atomic power has replaced a chapter on postwar chemistry.

Modern Office Gynecology. By George Blinick, M.D., F.A.C.S., Attending in Obstetrics and Gynecology, Beth Israel Hospital, New York City, and Sherwin A. Kaufman, M.D., F.A.C.S., Associate Attending in Obstetrics and Gynecology, Beth Isreal Hospital. Cloth. $4.50. Pp. 218, with 47 illustrations. Lea & Febiger, 600 S. Washington Sq., Philadelphia 6, 1957.

A compend is, at best, a fragmentary presentation of knowledge, and the authors have shown unusual recognition of the limitations of a pocket edition. One-third of this volume is devoted to a well-chosen bibliography, and, in each instance, a sentence or two prepares the reader for what may be expected in the more detailed articles. Thirty pages of line drawings clarify the text. The general practitioner and the casual worker in this specialty should find this small volume quite worthwhile.

QUERIES AND MINOR NOTES

ARTIFICIAL KIDNEY

To the Editor:—*For some time several members of the staff of a hospital have been interested in the purchase of an artificial kidney. Several models have been investigated, including the "pressure cooker" type, which could be manufactured for a few dollars. Please indicate the available kidneys, listed in the order of their functional capacity.*

David B. Thornburgh, M.D., Marietta, Ohio.

Answer.—There are a number of very efficient and satisfactory types of artificial kidney devices available on the market. The principal problem that presents itself in equipping a hospital with one of these devices, however, is not the type of kidney obtained so much as it is the need for an effective team of workers who are well versed in its manipulation and who are constantly available to apply it when needed. So often a hospital procures one of these complicated pieces of apparatus without appreciating the fact that its use requires a well-trained team of workers who have had considerable experience in its use and who are available when called upon at short notice. Unless such a team is available, it is an unwise expenditure of money to procure any such apparatus. The simple pressure-cooker type of artificial kidney is by far the cheapest available, but even it cannot be obtained for "a few dollars," as reported in the lay press. However, even this apparatus requires a trained team for its use. The simplest procedure, which requires no special apparatus and which is entirely adequate for most purposes in which an artificial kidney is desired, is the use of intermittent peritoneal lavage by the simplified procedure as described by Grollman (Acute Renal Failure, Springfield, Ill., Charles C Thomas, Publisher, 1954). It is this consultant's advice, therefore, that the personnel who will be responsible for carrying out the procedure first become acquainted with the various procedures available, including intermittent peritoneal lavage, and then purchase the type of apparatus with which they have become familiar. Otherwise the hospital will merely be saddled with the possession of another complicated piece of apparatus, the use of which by inexperienced personnel may entail more harm than benefit.

PORPHYRIA

To the Editor:—*Is there a successful or even helpful treatment for porphyria?* *M.D., Wisconsin.*

Answer.—An effective, reproducible form of treatment for porphyria is not available. Convincing evidence concerning the value of any but the most nonspecific forms of therapy is lacking. Prophylaxis is stressed in the management of acute intermittent porphyria; this includes avoidance of alcohol, barbiturates, and other toxic agents which have been shown to affect the disease adversely. Chloral hydrate, opiates, and paraldehyde may be employed for relief of pain and apprehension. Maintenance of nutrition and fluid and electrolyte balance are important objectives in treatment. Avoidance of actinic and mechanical trauma is of major importance in managing the cutaneous symptoms. Conflicting opinions have been expressed concerning the effectiveness of cortisone and corticotropin (ACTH) in treatment of porphyria; dramatic remissions and complete failures have been reported. Congenital porphyria is treated with hematological support and judicious splenectomy.

COMPARISON OF PATCH AND INTRADERMAL TUBERCULIN TESTING

To the Editor:—*Please discuss the relative merits of the Vollmer patch test and the Mantoux skin test for tuberculosis. Is the degree of discrepancy between the two such that the less accurate one could not be safely used for screening an elementary school population? How does one interpret the result when the two outer test areas are red, with distinct borders but not raised, and when, furthermore, these reaction areas disappear about four days after the removal of the patch? In the mass application of patch tests, what errors should be avoided in the application of the patch?*

L. David Comstock Jr., M.D., Dowagiac, Mich.

This inquiry has been referred to two consultants, whose respective replies follow.—Ed.

Answer.—The Vollmer patch test is alleged to have a 20% discrepancy when compared with the intradermal tuberculin test at proper dosage. These discrepancies are both false positives and false negatives. Therefore, the patch test cannot be used for any dependable studies and can be thought of as being merely a substitution for a Mantoux test under circumstances where it would be very difficult or inconvenient to use the latter, or where parental consent can be obtained for the patch test but not for the Mantoux test. The Vollmer test is safe, of course, but it should not be used in screening an elementary school population.

The test result as outlined in the question should be read as negative. Hazards in using the test can be avoided by placing the patch where the child cannot remove it (between the shoulder blades, for example) and by issuing instructions as to washing and bathing while the patch is on, as it must be kept as dry as possible.

Answer.—The forerunner of the Vollmer patch test was introduced and considerably used by Lautier, of France, in 1908.

The answers here published have been prepared by competent authorities. They do not, however, represent the opinions of any medical or other organization unless specifically so stated in the reply. Anonymous communications and queries on postal cards cannot be answered. Every letter must contain the writer's name and address, but these will be omitted on request.

A sizable number of comparative studies have been made with the patch test and the intracutaneous (Mantoux) method of administering tuberculin. Some workers have found a discrepancy of approximately 30% in favor of the intracutaneous method. Others have reported less difference in the results of the two tests.

Although it is generally agreed that the intracutaneous method is more accurate, the patch test is now used rather extensively in survey work, where, for one or more reasons, it does not seem feasible to use the intracutaneous method. For example, in St. Louis, the Academy of General Practice as a public service has administered the patch test to 125,000 school children with good results. The Iowa Tuberculosis and Health Association and the Iowa Trudeau Medical Society are employing the patch test in a statewide certification-of-schools project.

Allergy to tuberculoprotein among infected children is usually at a high level, since their infections were acquired relatively recently because of their age. Therefore, there has not been time for allergy to wane to any great extent.

It is usually thought that the patch test yields results comparable to the first dose of original tuberculin or purified protein derivative administered intracutaneously. Therefore, those who do not react to the former should then have a second dose of the latter administered. However, in survey work among school children this usually is not done.

Areas of redness of the skin from either method of administration are not considered as tuberculin reactions. The usually accepted characteristics consist of an area of edema or induration, or both, of 5 mm. or more in diameter.

Errors to be avoided in administration of the patch test include failure to cleanse the skin thoroughly with a fat solvent, applying the patch where the child can reach it and remove or loosen it (the interscapular area is a good location), applying the patch loosely so that the tuberculin is not in constant contact with the skin, and removing the patch in less than 48 hours.

INDISCRIMINATE PRESCRIBING

To the Editor:—*Is there any scientific basis for what seems to be an almost indiscriminate prescribing of the multiple vitamin preparations, particularly those that contain a long list of minerals and even the male and female sex hormones? This does not refer to the therapeutic use of vitamins when indicated.*

Connell H. Miller, M.D., Sligo, Pa.

Answer.—The indiscriminate prescribing of any medicament is to be deplored. The relative innocuousness of vitamins does not justify exception of them from this attitude. Simple combinations of reasonable quantities of those vitamins for which there is a recognized human requirement have a legitimate place in the treatment of deficiency states, in so-called "protective therapy" (as a preventive measure in instances in which some physiological or pathological process increases the requirement above the usual level), or as supplements to nutritionally restricted dietaries. The practice of prescribing "vitamins" without establishing a clear diagnostic reason is to be discouraged. The deliberate employment of a vitamin preparation as a placebo is not dishonest, but when so employing vitamins the physician should clearly recognize the reason for the prescription and should consider its cost to the patient.

The dosage of vitamins prescribed should bear some relationship to human requirements: for therapeutic use, multivitamin preparations containing five times or so the daily recommended allowances (Food and Nutrition Board, National Research Council Publication 302, 1953, p. 36) of the factors are reasonable; for supplementary use, amounts equivalent to the daily recommended allowances are adequate. In the instance of the fat-soluble vitamins A or D, gross overdosage leads to states of hypervitaminosis.

There is no sound justification for most vitamin-mineral combinations, especially for those that purport to contain long lists of "trace minerals and other essential elements." If mineral deficiencies exist, they are unlikely to be directly related to vitamin lack. Combination of sex hormones, antibiotics, or other therapeutic agents with vitamins is based on conjectural reasoning and a paucity of well-considered evidence. The dosage of the nonvitamin component in such combinations is often ineffectively small, but the formulation is inordinately expensive. The administration of such combinations should be limited to the exceedingly rare instance in which both agents are clearly needed and the dosage level is effective. A decision to use multivitamin preparations, alone or in combination with other medicaments (hormones, minerals), should in each instance be based on a careful analysis of the individual patient's needs and must not serve as a cover for ignorance as to the nature of the patient's illness.

PROLONGED POSTPARTUM BREAST SECRETION

To the Editor:—*A 21-year-old woman gave birth to her second child 18 months ago. Breast feeding was unsuccessful due to the watery nature of the milk, although the breasts were engorged. Since that time, the patient has had a more-or-less continual secretion of breast fluid. The fluid is thin and yellow-tinged and very irritating to the skin. Secretion is worse from the 10th day of the cycle and lasts right through the last day of the period. Large doses of testosterone help the condition slightly. Premarin has no effect. The secretion is bilateral, and both breasts are perfectly normal to palpation.*

M.D., North Carolina.

This inquiry has been referred to two consultants, whose respective replies follow.—Ed.

Answer.—This is one of the most annoying of all postpartum complications. The incidence is fairly rare and the duration usually short, although several cases of 10 to 12 years' duration have been recorded. Once breast feeding is judged not to be feasible, prompt attention should be given to the breasts. By accepted methods and possibly by endocrine therapy, the secretion is as a rule controlled. Persistent and prolonged secretion can become a distressing symptom, as in this

patient. Tincture of benzoin compound should be applied to the skin (a silicone solution has recently been tried for skin protection); the breasts should then be bound tightly and evenly with bland adhesive tape, and methyl testosterone, 10 mg. daily for 14 days, should be given. Paradoxically, it has been found that injection of the newer progesterone preparations (Delalutin, 250 mg.) once a month lessens the secretion from the breasts during therapy. In the past, x-ray therapy and even mastectomy have been recommended, which is indicative of the severity of this symptom, but certainly these are not considered at present. One should rule out the possibility of other pathology such as changes in the anterior pituitary, as galactorrhea is a symptom of certain types of endocrinopathy. Roentgenogram of the sella turcica should be made. Eighteen months certainly is a long time for both patient and doctor, but the prognosis, if there are no complications, is favorable.

ANSWER.—While the described breast secretion is not completely typical, it seems to be a variant of galactorrhea. When this condition is seen in association with amenorrhea, adenomas of the pituitary gland have frequently been discovered, and it is suggested that x-ray studies of the sella turcica be made. The condition has not infrequently been resistent to treatment. Fluid restriction, adequate support of the breasts, and avoidance of manipulation is suggested. On the assumption that the secretion may relate to some excess pituitary stimulation, relatively large doses of estrogen have been employed, as, for example, 10 mg. of Premarin and diethylstilbestrol, orally, from the end of menstruation for the succeeding two weeks. On occasion, the administration of 5 mg. of progesterone by injection for 4 doses at three-day intervals, begun at midcycle, has been of benefit.

CHRONIC CONJUNCTIVITIS

TO THE EDITOR:—*A patient with chronic conjunctivitis has not improved with antibiotic, allergic, and immunological treatment. A culture disclosed some diphtheroid organisms, similar to those found in some ulcerative cutaneous lesions in service personnel, which responded to local use of antitoxin in the form of wet dressings. Is there any record of the empirical use of diphtheria antitoxin, diluted or undiluted, by instillation into the conjunctival sac? Are there any risks in such application, assuming absence of sensitivity from previous use of serum?*

W. H. Elmer, M.D., Rockford, Ill.

ANSWER.—The only pertinent reference available is "Des Conjunctives" by A. Gabriélidès, 1921, page 117, in which undiluted diphtheria antitoxin was used successfully as an adjunct to parenteral therapy. The local use of diphtheria antitoxin in experimental animals, as well as culture sensitivity tests, is relatively simple. With the exception of a rare strain which is toxic and transferable in animals, diphtheroids are not toxic in human conjunctiva. Should local treatment with diphtheria antitoxin be used, supplementary parenteral injection of diphtheria antitoxin is suggested, unless hypersensitivity exists. A more frequent cause of the case described is a subconjunctival micrococcic (staphylococcic) infection combined with vascular hypersensitivity. The value of toxoid therapy may be experimentally determined with sensitivity tests.

PARALYSIS OF EYE MUSCLES

TO THE EDITOR:—*Could the application of whole-gland pituitary extract used to assist in hair growth have any adverse effects on a patient? A graduate nurse, aged 67 years, began this treatment in June, 1956, and used the product every other day for approximately four months, when she noted paralysis of the right internal rectus eye muscle. This cleared 3 days later, but 11 days after the onset of the paralysis in the right eye the same muscle of the left eye became paralyzed, and this condition still persists after two and a half weeks. There has been no diplopia, tinnitus, or deafness. With the attack on the right eye there was slight horizontal nystagmus (quick component to the left). When the left eye became involved, vertigo was very severe, with falling to the right. There is no history of eye trouble prior to the onset of this acute illness, and all examinations to date (spinal fluid, skull x-rays, neurological tests, eyegrounds, and blood pressure [135/80 mm. Hg]) are within normal limits for a patient aged 67. The only medicament the patient takes is Premarin, 1.25 mg., and methyltestosterone, 10 mg., daily for the past five years because of osteoporosis. Could there be some relation between the use of this hair conditioner and the eye involvement?*

Ella M. A. Enlows, M.D., Fort Lauderdale, Fla.

This inquiry has been referred to two consultants, whose respective replies follow.—ED.

ANSWER.—There is nothing in whole-gland pituitary extract likely to cause a paralysis of the ocular muscles. The possible causes of a paralysis of an ocular muscle in a 67-year-old patient include a host of neurological, vascular, and systemic conditions. The most likely causes at this age are arteriosclerosis involving the nucleus of the third nerve, a blood dyscrasia, a brain tumor, diabetes, myasthenia gravis, or an encephalomyelitis.

ANSWER.—No relation could possibly exist between the use of the hair conditioner and the eye involvement. The pituitary extract is a protein, and hence it is not absorbed by the skin and is rapidly destroyed by the bacteria of the scalp. Any benefit of this topical medicament would be due to the production of local hyperemia and the correction of dryness.

As for the eye muscle involvement, the absence of diplopia and ptosis suggests a conjugate deviation due to a supranuclear lesion. If so, the movement of convergence should still be elicited. With assumption of this mechanism, a single lesion on the left side could explain all the findings. In the transient irritative stage the eyes would deviate to the right, simulating a paresis of the right medial rectus, while in the permanent destructive stage the eyes would turn toward the left (i. e., to the lesion) and so simulate a paresis of the left medial rectus. The causes of

supranuclear palsies are varied. The postmenopausal osteoporosis in this case suggests a vascular basis, as deposition of calcium in the arterioles is a common factor in all types of osteoporosis. The patient's age, 67, and the vertigo immediately associated with the second eye finding suggest a "minor stroke."

TELEVISION RADIATION AND DERMATITIS

To the Editor:—*A 40-year-old patient has what appears to be a mild bilateral cicatricial entropion, conjunctivitis, and a generalized facial dermatitis characterized by dryness and dilated peripheral blood vessels. For the last seven years he has been employed as a television monitor. During this time he has worked seven to eight hours a day, five or six days each week, with his face 12 in. (or slightly less) from a television tube, making fine adjustments in the sharpness of the picture on the tube. What is the amount and nature of radiation emanating from a television tube source? Could this be the source of ophthalmological involvement?*

Grant B. Dallabough, M.D., Teaneck, N. J.

Answer.—In 1946, when the early impetus of television first struck the New York area, this consultant and others attempted to measure the x-radiation and the ultraviolet radiation from a television tube. The glass in the tube absorbed all the ultraviolet rays, and no x-rays coming from any part of the tube were detected. It is doubted whether this would be the source of the dermatitis, with entropion and conjunctivitis.

TELEVISION RADIATION

To the Editor:—*Please supply information as to whether television sets emit radioactive rays and whether there might be some danger, especially for children, if they sit too close to the television set.*

Artur Philipsborn, M.D., Cleveland.

This inquiry has been referred to three consultants, whose respective replies follow.—Ed.

Answer.—X-rays produced in the commonly used television sets have energies of 15,000 to 20,000 volts. They have little penetration and are absorbed in the faceplate of the picture tube. In addition, many sets have plastic or glass plates in front of the faceplate for further safety. For tubes using higher voltages, 25,000 volts or more, such as the color television tubes, some rays penetrate through the faceplate, and the tube manufacturers warn that safety glass, ¼ to ⅜ in. thick, should be placed in front of the faceplate. It seems certain that the manufacturers of television sets, in their own interest, will heed the warning of the tube manufacturers, in addition to carrying out their own controls so as to ensure the safety of their product.

Answer.—In the course of many years of both clinical and private practice, this consultant has never seen any patient demonstrating any appreciable biological effect from rays emitted by a television tube. The rays emitted by the usual tube are similar to the very soft grenz rays. The risk of exposure beyond the screen of the apparatus is of little consequence. With the new type of television apparatus, however, where the rays are generated at an energy of 25 kv., a type of soft x-ray is produced which may have some biological effect on those viewers who may be in direct contact with the television screen. A physicist is better equipped to measure the exact value of the rays emitted by the television tube.

Answer.—It is true that some "radioactive rays" do emanate from the electron tube of a television set. However, these rays are extremely soft and are completely dissipated by the glass screen or wooden cabinet of the set. Research at the Sarnoff Laboratories, in Princeton, N. J., indicates that there are no harmful effects because of radiation from watching or sitting near a television set. This is true of children as well as of adults.

CONDUCTIVE SHOES FOR USE IN OPERATING ROOM

To the Editor:—*Please supply information concerning use of shoes, or metallic clips which can be attached to shoes, so that surgical personnel will be made nonconductive for static electricity. The hospital has adequate grounding of equipment, outlets, and electrically conductive flooring in the operating room. The only problem is to find a simple piece of apparatus which can be used to see that all personnel in surgery are properly grounded.*

Meyer Schindler, M.D., San Francisco.

Answer.—First, this consultant would like to correct a common error made when talking about safety measures in hospitals. The inquirer in this instance requested information on appliances for shoes that would make surgical personnel "nonconductive for static electricity." It is certain that the information requested is for a simple economical device that will provide contact from personnel to a conductive floor in order to make the individual and floor continuously "conductive for static electricity."

A conductor is a material that will permit the flow of electricity over or through it. A nonconductor is a material that will not permit the flow of electricity over or through it.

Conductive footwear of some type must be worn by all personnel in the anesthetizing locations. Conductive soled shoes are available today in many department and shoe stores throughout the United States. Since the price is not prohibitive, this consultant feels that doctors, nurses, orderlies, and maids who work in the anesthetizing locations in hospitals should wear conductive shoes. Substitutes, such as conductive booties, slip-ons, and snap-on heels, are fairly satisfactory; however, they may prove to be expensive because of frequent replacement and present a nonprofessional appearance. The names and manufacturers of various types of conductive footwear may be obtained by writing to the Committee on Hospital Hazards of the American Society of Anesthesiologists.

A simple inexpensive device for conductive footwear was described by Virtue and associates in *Anesthesiology* (15:113, 1954). They recommended

that an aluminum strip from an intravenous infusion bottle be bent so that it will touch the sock inside of the shoe and then make contact with the floor at the broad part of the heel; it can be held in position with small nails or adhesive. The aluminum strips are satisfactory, unless the wearer has especially thick socks, in which case he should dampen them slightly at the heel.

YELLOW-TINTED GLASSES

To the Editor:—*My hobby is target shooting. I frequently see advertisements for yellow-tinted glasses, designed to increase the contrast and details of the target. These are also supposed to be particularly effective on cloudy or overcast days. I would like an opinion from an ophthalmologist both as to their effectiveness and as to the amount of tint required to attain this.*

John D. Jennings, M.D., Hugo, Okla.

Answer.—Yellow-tinted glasses transmit yellow unchanged, but the short-wave rays of blue and green are diminished. When used at dusk or on overcast days, the yellow becomes relatively brighter than the blue or green. Hence, yellowish animals appear more distinct, and for this reason such glasses have been used by hunters for years. If used to overcome dazzling, a deep tint is required, but on cloudy days a light tint is more advantageous.

SWEAT APPARATUS IN ANIMALS AND MAN

To the Editor:—*Please provide information on which animals are most closely related to humans regarding the sweat apparatus.*

Marvin N. Winer, M.D., Buffalo, N. Y.

This inquiry has been referred to two consultants, whose respective replies follow.—Ed.

Answer.—The structure and function of sweat glands in the pads of the foot and digits of domestic cats correspond closely to those of the eccrine glands of man. The chimpanzee has numerous eccrine glands over its body, but the sweating responses of these glands have not been investigated. The sweat of the horse, the dog, and the ox is secreted by apocrine glands, which are structurally and physiologically different from the eccrine glands.

Answer.—Sweat or perspiration is not found to occur over the general surface of the body in any hairy animal other than the horse. In the horse, certain parts of the skin sweat more readily than others. The base of the ears is the first place for sweat to appear. This is followed by the appearance of sweat along the neck, the sides of the chest, along the surface of the back, and, lastly, the hind quarters. There is no sweating of the legs—the fluid found there has run down from the other body surface. The mule and the donkey sweat with difficulty and then only at the base of the ears. Cattle sweat freely from the muzzle. Sometimes the general surface of the body may appear to be sweating. Sheep do not sweat in the ordinary way, in which the sensible sweat is observed. The pig sweats only on his snout. The dog and the cat sweat freely from the foot pads and the muzzle. There is no sensible perspiration, however, from the general surface of the body.

The sweating process is a continuous one in animals; when excreted in small amounts, the fluid is evaporated as fast as it forms and is passed off as an insensible vapour—hence the name "insensible sweat or perspiration." When the body condition is such as to produce more fluid and the atmospheric condition is unfavorable to its evaporation, this fluid collects on the skin and is ordinarily called sweat or "sensible perspiration."

ABDOMINAL PAIN FOR FIFTEEN YEARS

To the Editor:—*A 40-year-old woman has had right lower quadrant pain periodically for 15 to 20 years. There has been no relation to menses. Treatment has consisted of foreign-protein injections, with some considerable relief. Pain has become so severe recently, with signs of femoral nerve irritation, that operation was undertaken. Operation revealed a small mass in the broad ligament and along the pelvic wall that grossly resembled a sarcoma. Although complete removal of the mass was impossible, considerable improvement followed and lasted for about two months. The pathological diagnosis was chronic granulomatous inflammation of the pelvis, etiology undetermined. No acid-fast organisms were found on stain. No culture was done because of the feeling that the condition was sarcoma. The patient has a positive patch test for tuberculosis and has a sister with draining chest sinuses due to tuberculosis. Her chest x-ray has been normal over the past three years since her last contact with her sister. Currently she is in remission from pain after receiving 40 units of corticotropin (ACTH) on two successive days. Is treatment as such advisable in view of the long history of pain, or should the antituberculosis drugs be tried? The patient is very reluctant to submit to operation again.*

M.D., Ohio.

This inquiry has been referred to two consultants, whose respective replies follow.—Ed.

Answer.—Further diagnostic studies should be carried out on this patient in the form of aspiration biopsy of the mass in the broad ligament and along the pelvic wall. This should be done through the vagina with a long, large-bore needle in which a special suction syringe, devised at Memorial Center in New York City and supplied by United Surgical Supply Company, Port Chester, N. Y., is used. Satisfactory material should be obtained for cytological study as well as culture, and further definitive treatment should depend on reports of studies of material taken.

Answer.—The only implication of neurological involvement is the statement "femoral nerve irritation." If this is a true nerve involvement, then the immediate program for the patient should consist of x-rays of the lumbar sacral spine; lumbar puncture, with careful manometric studies; examination of the spinal fluid for total protein, sugar, and cells; Wassermann reaction; and colloidal gold test. The spinal fluid should be cul-

tured and centrifuged for direct smear of precipitate and Papanicolaou stain. If there is no evidence of involvement of the spinal vertebrae, pelvis, spinal cord, and cauda equina, then it is the opinion of this consultant that a reexploration is mandatory.

PERSISTENT LIVER TENDERNESS AFTER HEPATITIS

To the Editor:—*A patient has persistent liver tenderness four and a half months after viral hepatitis. He apparently contracted this hepatitis on a tour of the Caribbean. After being sick for six weeks, he gradually returned to full-time work. Liver-function tests now are practically normal. Any suggestion of therapy will be greatly appreciated.*

M.D., California.

This inquiry has been referred to two consultants, whose respective replies follow.—Ed.

Answer.—It is not unusual to have some degree of discomfort and tenderness in the right upper quadrant following exertion as long as four to six months after the onset of hepatitis. One cannot be quite sure what is meant by the statement, "Liver-function tests are practically normal." If this is true for such significant tests as Bromsulphalein dye retention, thymol turbidity, and serum bilirubin, one would think that there would be little reason to be concerned over eventual prognosis at this time. There is no specific therapy to recommend. Undue fatigue should be avoided, and, when discomfort does occur, greater than usual periods of rest should be taken. Hepatic function and physical examination should be checked at intervals of three weeks.

Answer.—The persistence of liver pain and tenderness after apparent recovery from viral hepatitis suggests that the recovery is not yet complete. It is stated that the liver-function tests are "practically" normal. What tests remain abnormal, and what is their degree of abnormality? A high degree of Bromsulphalein retention is indicative of chronic liver disease. A mild hyperbilirubinemia may indicate the presence of a smoldering hepatitis. In some cases the presence of one of the sequelae of hepatitis cannot be definitely ascertained without liver biopsy.

The treatment of the sequelae of hepatitis is similar to that of the acute disease and consists of rest, high-protein diet, and vitamin supplements. The degree of activity allowed should be just short of provoking liver pain and tenderness. If hyperbilirubinemia persists, the steroids or corticotropin are useful therapeutic adjuvants.

CULDOSCOPY TO DIAGNOSE ECTOPIC PREGNANCY

To the Editor:—*What is the value of culdoscopy in the diagnosis of ectopic pregnancy? Is it applicable?*

Thomas C. Case, M.D., New York.

Answer.—Several series of patients in whom culdoscopic examination has been employed give evidence that this procedure has resulted in the early diagnosis of unruptured tubal pregnancy in a significant percentage of cases. The use of proper anesthetic techniques, either local infiltration or low spinal, together with careful introduction of the culdoscope, seems to carry minimal risk. In cases of suspected ectopic pregnancy, many prefer preliminary needle puncture of the cul-de-sac to detect the presence of blood in the peritoneal cavity. Culdotomy, opening of the cul-de-sac to allow palpation and visualization, is preferred by some.

BIOPSY OF CERVIX

To the Editor:—*Please describe an adequate and acceptable procedure for the biopsy of a cervix showing a velvety erosion surrounding the external os.*

M.D., New York.

Answer.—Any cervical erosion should be subjected to a routine office biopsy. This is a simple procedure and without hazard to the patient. A simple punch biopsy forcep is utilized, and tissue is obtained from the 12, 3, 6, and 9 o'clock locations around the external os. This four-quadrant procedure eliminates the possibility of missing a circumscribed lesion. A cervix from which a biopsy specimen is so obtained is not cauterized or otherwise treated until the pathologist's report is obtained. This information will then determine the procedure to be followed.

MULTIPLE SCLEROSIS

To the Editor:—*A woman patient is suffering from multiple sclerosis. Please provide information concerning long-term treatment.*

George Welker Jr., M.D., Morganfield, Ky.

Answer.—There is no specific treatment for multiple sclerosis, but there is reason to believe that comprehensive medical management helps these patients, and they are certainly entitled to the benefits of good supportive therapy. The rationale is outlined by Wainerdi (*M. Ann. District of Columbia* **23**:7, 1954).

CAUTIONS IN USING ARTIFICIAL KIDNEY

To the Editor:—*Have any deaths resulted from the use of the artificial kidney for dialysis of poisons? Is it ever the cause of any morbidity? There is considerable interest in its usefulness in poisoning, and a knowledge of any dangers inherent or encountered is essential.* *J. Greenblatt, M.D., Stamford, Conn.*

Answer.—Since patients subjected to dialysis by the artificial kidney for any purpose are in critical condition, it is obviously impossible to state if deaths have resulted from the use of this procedure. However, on the basis of experimental studies on dogs, it has been demonstrated that many precautions must be taken if one is to avoid harmful effects. Thus the use of an excessive dose of anticoagulant, toxic agents present in the membrane, overloading with fluid, or loss of blood volume into the membrane could prove fatal. With proper use by experienced personnel, however, there should be no cause for morbidity or harm from these sources. Details of the advantages and disadvantages of the artificial kidney as compared to other procedures are given in "Acute Renal Failure" by Grollman (Springfield, Ill., Charles C Thomas, Publisher, 1954).